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THE DIVINE PYMANDER OF HERMES TRISMEGISTUS.

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THE TENTH BOOK OF HERMES TRISMEGISTUS: THE MINDE TO HERMES.

1. Forbear thy Speech, O *Hermes Trismegistus*, and call to minde those things that are said; but I will not delay to speak what comes into my minde, sithence many men have spoken many things and those very different, concerning the Universe, and Good; but I have not learned the Truth.

2. Therefore, the Lord make it plain to me in this point; for I will believe thee only, for the manifestation of these things.

3. Then said the Minde how the case stands.

4. God and All.

5. God, Eternity, the World, Time, Generation.

6. God made Eternity, Eternity the World, the World Time, and Time Generation.

7. Of God, as it were, the Substance, is the *Good*, the *Fair*, *Blessedness*, *Wisdom*.

8. Of Eternity, Identity, of Selfness.

9. Of the World, Order.

10. Of Time, Change.

11. Of Generation, Life and Death.

12. But the Operation of God, is Minde and Soul.

13. Of Eternity, Permanence, or Long-lasting, and Immortality.

14. Of the World, Restitution, and Decay, or Destruction.
15. Of Time, Augmentation and Diminution.
16. And of Generation qualities.
17. Therefore, Eternity is in God.
18. The World in Eternity.
19. Time in the World.
20. And Generation in Time.
21. And Eternity standeth about God.
22. The World is moved in Eternity.
23. Time is determined in the World.
24. Generation is done in Time.
25. Therefore, the Spring and Fountain of all things is God.
26. The Substance Eternity.
27. The Matter is the World.
28. The Power of God is Eternity.
29. And the Work of Eternity, is the World not yet made, and yet ever made by Eternity.
30. Therefore, shall nothing be at any time destroyed, for Eternity is incorruptible.
31. Neither can anything perish, or be destroyed in the World, the World being contained and embraced by Eternity.
32. But what is the Wisdom of God? Even the *Good* and the *Fair*, and *Blessedness*, and every *Vertue*, and Eternity.
33. Eternity, therefore, put into the Matter Immortality and Everlastingness; for the Generation of that depends upon Eternity even as Eternity doth of God.
34. For Generation and Time, in Heaven and in Earth, are of a double Nature; in Heaven they are unchangeable and incorruptible; but on Earth they are changeable and corruptible.
35. And the Soul of Eternity is God; and the Soul of the World, Eternity; and of the earth Heaven.
36. God is in the Minde, the Minde in the Soul, the Soul in the Matter, all things by Eternity.
37. All this Universal Body, in which are all Bodies, is full of Soul, the Soul full of Minde, the Minde full of God.
38. For within he fills them, and without he contains them, quickening the Universe.
39. Without, he quickens this perfect living thing the World, and within all living Creatures.

40. And above in Heaven he abides in Identity or Selfness, but below upon Earth he changeth Generation.

41. Eternity comprehendeth the World either by necessity, or Providence, or by Nature.

42. And if any man shall think any other thing, it is God that actuateth, or operateth this All.

43. But the operation or Act of God, is Power insuperable, to which none may compare anything, either Humane or Divine.

44. Therefore, O *Hermes*, think none of these things below, or the things above, in anywise like unto God; for if thou dost, thou errest from the Truth.

45. For nothing can be like the unlike, and onely, and One; nor mayest thou think that he hath given of his Power to any other thing.

46. For who after him can make anything, either of Life or Immortality; of Change or of Quality? and himself, what other things should he make?

47. For God is not idle, for then all things would be idle; for all things are full of God.

48. But there is not anywhere in the World, such a thing as Idleness; for Idleness is a name that implieth a thing void or empty, both of a Doer, and a thing done.

49. But all things must necessarily be made or done both always, and according to the nature of every place.

50. For he that maketh or doth, is in all things, yet not fastened or comprehended in anything; nor making or doing one thing, but all things.

51. For being an active or operating Power, and sufficient of himself, for the things that are made, and the things that are made are under him.

52. Look upon, through me, the World is subject to thy sight, and understand exactly the Beauty thereof.

53. A Body perpetual, then the which there is nothing more ancient, yet always vigorous and young.

54. See also the Seven Worlds set over us, adorned with an everlasting order, and filling Eternity with a different course.

55. For all things are full of Light, but the Fire is nowhere.

56. For the friendship and commixture of contraries and unlike, become Light shining from the Act or Operation of God, the

Father of all Good, the Prince of all Order, and the Ruler of the Seven Worlds.

57. Look also upon the Moon, the forerunner of them all, the Instrument of Nature, and which changeth the matter here below.

58. Behold the Earth the middle of the Whole, the firm and stable Foundation of the Fair World, the Feeder and Nurse of Earthly things.

59. Consider, moreover, how great the multitude is of immortal living things, and of mortal ones also; and see the Moon going about in the midst of both, to wit, of things immortal and mortal.

60. But all things are full of Soul, and all things are properly moved by it; some things about the Heaven, and some things about the Earth; and neither of those on the right hand to the left; nor those on the left hand to the right; nor those things that are above, downward; nor those things that are below, upwards.

61. And that all these things are made, O beloved *Hermes*, thou needst not learn of me.

62. For they are Bodies, and have a Soul, and are moved.

63. And that all these should come together into one, it is impossible without something to gather them together.

64. Therefore, there must be some such ones, and he altogether One.

65. For seeing that the motions are divers, and many, and the Bodies not alike, and yet one ordered swiftness among them all. It is impossible there should be two or more Makers.

66. For one order is not kept by many.

67. But in the weaker there would be jealousy of the stronger, and thence also contentions.

68. And if there were one Maker, of mutable mortal living Wights, he would desire also to make immortal ones, as he that were the Maker of immortal ones, would do to make mortal.

69. Moreover, also, if there were two, the Matter being one, who should be chief, or have the disposing of the facture?

70. Or if both of them, which of them the greater part?

71. But thinks thus that every living Body hath its consistence of Matter and Soul; and of that which is immortal, and that which is mortal and unreasonable.

72. For all living Bodies have a Soul; and those things that are not living, are onely matter by itself.

73. And the Soul likewise of itself drawing near her Maker, is the cause of Life and Being, and being the cause of Life is, after a maner, the cause of immortal things.

74. How then are mortal Wights other from immortal?

75. Or how cannot he make living wights, that causeth immortal things and immortality?

76. That there is some Body that doth these things, it is apparent, and that he is also one, it is most manifest.

77. For there is one Soul, one Life, and one Matter.

78. Who is this? who can it be, other then the *One God?*

79. For whom else can it benefit, to make living things, save onely God alone?

80. There is therefore one God.

81. For it is a ridiculous thing to confess the World to be one, one Sun, one Moon, one Divinity; and yet to have I know not how many gods.

82. He therefore being One, doth all things in many things.

83. And what great thing is it for God, to make Life, and Soul, and Immortality, and Change, when thy self dost so many things.

84. For thou both seest, speakest, and hearest, smellest, tastest, and touchest, walkest, understandest, and breathest.

85. And it is not one that seeth, and another that heareth, and another that speaketh, and another that toucheth, and another that smelleth, and another that walketh, and another that understandeth, and another that breatheth; but One that doth all these things.

86. Yet neither can these things possibly be without God.

87. For as thou, if thou shouldst cease from doing these things, wert not a living wight; so if God should cease from those, he were not (which is not lawful to say) any longer God.

88. For if it be already demonstrated, that nothing can be idle or empty, how much more may be affirmed of God?

89. For if there be any thing which he doth not do, then is he (if it were lawful to say so) imperfect.

90. Whereas seeing he is not idle, but perfect; certainly he doth all things.

91. Now give thy self unto me, O *Hermes*, for a little while, thou shalt the more easily understand, that it is the necessary work of God, that all things should be made or done, that are done, or were once done or shall be done.

92. And this, O best Beloved, is life.

93. And this is the *Fair.*

94. And this is the *Good.*

95. And this is *God.*

96. And if thou wilt understand this by work also, mark what happens to thy self, when thou wilt generate.

97. And yet this is not like unto him; for he is not sensible of pleasure, for neither hath he any other Fellow-workman.

98. But being himself the onely Workman, he is always in the Work, himself being that which he doth or maketh.

99. For all things, if they were separated from him, must needs fall and die, as there being no life in them.

100. And again, if all things be living wights, both which are in Heaven, and upon Earth; and that there be one Life in all things which is made by God, and that is God, then certainly all things are made, or done by God.

101. Life is the union of the Minde, and the Soul.

102. But death is not the destruction of those things that were gathered together, but a dissolving of the Union.

103. The Image therefore of God, is Eternity, of Eternity the World, of the World the Sun, of the Sun Man.

104. But the people say, That changing is Death, because the Body is dissolved, and the Life goeth into that which appeareth not.

105. By this discourse, my dearest *Hermes*, I affirm as thou hearest, That the World is changed, because every day part thereof becomes invisible; but that it is never dissolved.

106. And these are the Passions of the World, Revolutions, and Occultations, and Revolution is a turning, but Occultation is Renovation.

107. And the World being all formed, hath not the forms lying without it, but it self changeth in it self.

108. Seeing then the World is all formed, what must he be that made it? for without form, he cannot be.

109. And if he be all formed, he will be kept like the World; but if he have but one form, he shall be in this regard less then the World.

110. What do we then say that he is? we will not raise any doubts by our speech; for nothing that is doubtful concerning God, is yet known.

111. He hath therefore one *Idea* which is proper to him, which because it is unbodily, is not subject to the sight, and yet shews all forms by the Bodies.

112. And do not wonder, if there be an incorruptible *Idea.*

113. For they are like the Margents of that Speech which is in writing; for they seem to be high and swelling, but they are by nature smooth and even.

114. But understand well this that I say, more boldly, for it is more true: As a man cannot live without life, so neither can God live, not doing good.

115. For this is, as it were, the Life and Motion of God, to move all things, and quicken them.

116. But some of the things I have said, must have a particular explication: Understand then what I say.

117. All things are in God, not as lying in a place; for Place is both a Body, and unmoveable, and those things that are there placed, have no motion.

118. For they lie otherwise in that which is unbodily, then in the fantasie, or to appearance.

119. Consider him that contains all things, and understand, that nothing is more capacious, then that which is incorporeal, nothing more swift, nothing more powerful; but it is most capacious, most swift, and most strong.

120. And judg of this by thy self, command thy Soul to go into *India*, and sooner then thou canst bid it, it will be there.

121. Bid it likewise pass over the *Ocean*, and suddenly it will be there: Not as passing from place to place, but suddenly it will be there.

122. Command it to flie into Heaven, and it will need no Wings, neither shall any thing hinder it; not the fire of the Sun, not the *Aether*, not the turning of the Spheres, not the bodies of any of the other Stars, but cutting through all, it will flie up to the last, and furthest Body.

123. And if thou wilt even break the whole, and see those things that are without the World (if there be any thing without) thou mayest.

124. Behold how great power, how great swiftness thou hast! Canst thou do all these things, and cannot God?

125. After this maner therefore contemplate God to have all

the whole World to himself, as it were all thoughts, or intellections.

126. If therefore thou wilt not equal thy self to God, thou canst not understand God.

127. For the like is intelligible by the like.

128. Increase thy self unto an immeasurable greatness, leaping beyond every Body, and transcending all Time, become Eternity, and thou shalt understand God: If thou believe in thys elf, that nothing is impossible, but accountest thy self immortal, and that thou canst understand all things, every Art, every Science, and the maner and custom of every living thing.

129. Become higher then all height, lower then all depths, comprehend in thy self the qualities of all the Creatures, of the Fire, the Water, the Dry, and Moyst; and conceive likewise that thou canst at once be every where in the Sea, in the Earth.

130. Thou shalt at once understand thy self, not yet begotten in the Womb, young, old, to be dead, the things after death, and all these together; as also, times, places, deeds, qualities, quantities, or else thou canst not yet understand God.

131. But if thou shut up thy Soul in the Body, and abuse it, and say, I understand nothing, I can do nothing, I am afraid of the Sea, I cannot climb up into Heaven, I know not who I am, I cannot tell what I shall be; what hast thou to do with God? for thou canst understand none of those Fair and Good things; be a lover of the Body, and Evil.

132. For it is the greatest evil, not to know God.

133. But to be able to know, and to will, and to hope, is the straight way, and Divine way, proper to the Good; and it will every where meet thee, and every where be seen of thee, plain and easie, when thou dost not expect or look for it: It will meet thee, waking, sleeping, sailing, traveling by night, by day, when thou speakest, and when thou keepest silence.

134. For there is nothing which is not the Image of God.

135. And yet thou sayest, God is invisible, but be advised, for who is more manifest, then He.

136. For therefore hath he made all things, that thou by all things mayest see him.

137. This is the Good of God, this is his Vertue, to appear, and to be seen in all things.

138. There is nothing invisible, no not of those things that are incorporeal.

139. The Minde is seen in Understanding, and God is seen in doing or making.

140. Let these things thus far forth, be made manifest unto thee, O *Trismegistus.*

141. Understand in like maner, all other things by thy self, and thou shalt not be deceived.

(*The end of the tenth Book.*)

THE ELEVENTH BOOK OF HERMES TRISMEGISTUS: OF THE COMMON MINDE TO TAT.

1. The Minde, O *Tat*, is of the very Essence of God, if yet there be any Essence of God.

2. What kinde of Essence that is, he alone knows himself exactly.

3. The Minde therefore is not cut off, or divided from the essentiality of God, but united as the light of the Sun.

4. And this Minde in men, is God, and therefore are some men Divine, and their Humanity is neer Divinity.

5. For the good *Demon* called the Gods immortal men, and men mortal Gods.

6. But in the bruit Beasts, or unreasonable living wights, the Minde is their Nature.

7. For where there is a Soul, there is the Minde; as where there is Life, there is also a Soul.

8. In living Creatures therefore, that are without Reason, the Soul is Life, voyd of the operations of the Minde.

9. For the Minde is the Benefactor of the Souls of men, and worketh to the proper Good.

10. And in unreasonable things it co-operateth with the Nature of every one of them, but in men it worketh against their Natures.

11. For the Soul being in the Body, is straight way made Evil by Sorrow, and Grief, and Pleasure or Delight.

12. For Grief and Pleasure, flow like Juices from the compound Body, whereinto, when the Soul entereth, or descendeth, she is moystened and tincted with them.

13. As many Souls therefore, as the Minde governeth or over-

ruleth, to them it shews its own Light, resisting their prepossessions or presumptions.

14. As a good Physitian grieveth the Body, prepossessed of a disease, by burning or launcing it for healths sake.

15. After the same maner also, the Minde grieveth the Soul, by drawing it out of Pleasure, from whence every disease of the Soul proceedeth.

16. But the great Disease of the Soul is *Atheism*, because that opinion followeth to all Evil, and no Good.

17. Therefore the Minde resisting it, procureth Good to the Soul, as a Physitian health to the Body.

18. But as many Souls of men, as do not admit or entertain the Minde for their Governor, do suffer the same thing that the Soul of unreasonable living things.

19. For the Soul being a *Co-operator* with them, permits or leaves them to their concupiscences, whereunto they are carried by the torrent of their Appetite, and so tend to bruitishness.

20. And as bruit Beasts, they are angry without reason, and they desire without reason, and never cease, nor are satisfied with evil.

21. For unreasonable Angers and Desires, are the most exceeding Evils.

22. And therefore hath God set the Minde over these, as a Revenger and Reprover of them.

23. *Tat.* Here, O Father, that discourse of Fate or Destiny, which thou madest to me, is in danger to be overthrown: For if it be fatal for any man to commit *Adultery* or *Sacriledg*, or do any evil, he is punished also, though he of necessity do the work of Fate or Destiny?

24. *Herm.* All things, O Son, are the work of Fate, and without it, can no bodily thing, either Good or Evil be done.

25. For it is decreed by Fate, that he that doth any evil, should also suffer for it.

26. And therefore he doth it, that he may suffer that which he suffereth, because he did it.

27. But for the present let alone that speech, concerning Evil and Fate, for at other times we have spoken of it.

28. Now our discourse is about the Minde, and what it can do,

and how it differs, and is in men such a one, but in bruit Beasts changed.

29. And again, in bruit Beasts it is not beneficial, but in men by quenching both their Anger and Concupiscences.

30. And of men thou must understand, some to be rational or governed by reason, and some irrational.

31. But all men are subject to Fate, and to Generation, and Change; for these are the beginning and end of Fate or Destiny.

32. And all men suffer those things that are decreed by Fate.

33. But rational men, over whom, as we said, the Minde bears rule, do not suffer like unto other men; but being free from viciousness, and being not evil, they do suffer evil.

34. *Tat.* How sayest thou this again Father? An *Adulterer*, is he not evil? a *Murtherer*, is he not evil? and so all others.

35. *Herm.* But the rational man, O Son, will not suffer for Adultery, but as the Adulterer, nor for Murther, but as the Murtherer.

36. And it is impossible to escape the Quality of Change, as of Generation, but the Viciousness, he that hath the Minde, may escape.

37. And therefore, O Son, I have always heard the good *Demon* say, and if he had delivered it in writing, he had much profited all mankinde: For he alone, O Son, as the first born, God, seeing all things, truly spake Divine words. I have heard him say sometimes, *That all things are one thing, especially intelligible Bodies, or that all especially intelligible Bodies are one.*

38. We live in Power, in Act, and in Eternity.

39. Therefore a good Minde, is that which the Soul of him is.

40. And if this be so, then no intelligible thing differs from intelligible things.

41. As therefore it is possible, that the Minde, the Prince of all things; so likewise, that the Soul that is of God, can do whatsoever it will.

42. But understand thou well, for this Discourse I have made to the Question which thou askest of me before, I mean concerning Fate and the Minde.

43. First, if, O Son, thou shalt diligently withdraw thy self from all Contentious speeches, thou shalt finde that in Truth, the

Minde, the Soul of God bears rule over all things, both over Fate, and Law, and all other things.

44. And nothing is impossible to him, no not of the things that are of Fate.

45. Therefore, though the Soul of man be above it, let it not neglect the things that happen to be under Fate.

46. And these thus far, were the excellent sayings of the good *Demon.*

47. *Tat.* Most divinely spoken, O Father, and truly and profitably, yet clear this one thing unto me.

48. Thou sayest, that in bruit Beasts the Minde worketh or acteth after the maner of Nature, co-operating also with their (ὁρμὰς, *impetus*) inclinations.

49. Now the impetuous inclinations of bruit Beasts, as I conceive, are Passions. If therefore the Minde do co-operate with these impetuous Inclinations, and that they are the Passions in bruit Beasts, certainly the Minde is also a Passion, conforming it self to Passions.

50. *Herm.* Well done Son, thou askest nobly, and yet it is just that I should answer thee.

51. All incorporeal things, O Son, that are in the Body, are passible, nay, they are properly Passions.

52. Every thing that moveth is incorporeal; every thing that is moved is a Body; and it is moved into the Bodies by the Minde; Now Motion is Passion, and there they both suffer; as well that which moveth, as that which is moved, as well that which ruleth, as that which is ruled.

53. But being freed from the Body, it is freed likewise from Passion.

54. But especially, O Son, there is nothing impassible, but all things are passible.

55. But Passion differs from that which is passible; for that (Passion) acteth, but this suffers.

56. Bodies also of themselves do act; for either they are unmoveable, or else are moved; and which soever it be, it is a Passion.

57. But incorporeal things do always act, or work, and therefore they are passible.

58. Let not therefore the appellations or names trouble thee,

for Action and Passion are the same thing, but that it is not grievous to use the more honorable name.

59. *Tat.* O Father, thou hast delivered this Discourse most plainly.

60. *Herm.* Consider this also, O Son, That God hath freely bestowed upon man, above all other living things, these two, to wit, Minde and Speech, or Reason, λόγος, equal to immortality.

61. These if any man use, or imploy upon what he ought, he shall differ nothing from the Immortals.

62. Yea rather going out of the Body, he shall be guided and led by them, both into the Quier and Society of the Gods, and blessed Ones.

63. *Tat.* Do not other living Creatures use Speech, O Father?

64. *Herm.* No, Son, but onely Voyce; now Speech and Voyce do differ exceeding much; for Speech is common to all men, but Voyce is proper unto every kinde of living thing.

65. *Tat.* Yea, but the Speech of men is different, O Father; every man according to his Nation.

66. *Herm.* It is true, O Son, they do differ: Yet as man is one, so is Speech one also; and it is interpreted and found the same, both in *Egypt*, *Persia*, and *Greece*.

67. But thou seemest unto me, Son, to be ignorant of the Vertue, or Power, and Greatness of Speech.

68. For the blessed God, the good *Demon* said or commanded the Soul to be in the Body, the Minde in the Soul (λόγος), the Word, or Speech, or Reason in the Minde, and the Minde in God, and that God is the Father of them all.

69. Therefore the Word is the Image of the Minde, and the Minde of God, and the Body of the *Idea*, and the *Idea* of the Soul.

70. Therefore of the Matter, the subtilest or smallest part is Air, of the Air the Soul, of the Soul the Minde, of the Minde God.

71. And God is about all things, and through all things, but the Minde about the Soul, the Soul about the Air, and the Air about the Matter.

72. But Necessity, and Providence, and Nature, are the Organs or Instruments of the World, and of the Order of Matter.

73. For of those things that are intelligible, every one is; but the Essence of them is Identity.

74. But of the Bodies of the whole, or universe, every one is many things.

75. For the Bodies that are put together, and that have, and make their changes into other, having this Identity, do always save and preserve the uncorruption of the Identity.

76. But in every one of the compound Bodies, there is a number.

77. For without Number it is unpossible there should be consistence or constitution, or composition, or dissolution.

78. But Unities do both beget and increase Numbers, and again being dissolved, come into themselves.

79. And the Matter is One.

80. But this whole World, the great God, and the Image of the Greater, and united unto him, and conserving the Order, and Will of the Father, is the fulness of Life.

81. And there is nothing therein, through all the Eternity of the Revolutions, neither of the whole, nor of the parts which doth not live.

82. For there is nothing dead, that either hath been, or is, or shall be in the World.

83. For the Father would have it as long as it lasts, to be a living thing; and therefore it must needs be God also.

84. How therefore, O Son, can there be in God, in the Image of the Universe, in the fulness of Life, any dead things?

85. For dying is corruption, and corruption is destruction.

86. How then can any part of the incorruptible be corrupted, or of God be destroyed?

87. *Tat.* Therefore, O Father, do not the living things in the World die, though they be parts thereof.

88. *Herm.* Be wary in thy Speech, O Son, and not deceived in the names of things.

89. For they do not die, O Son, but as compound Bodies they are dissolved.

90. But dissolution is not death; and they are dissolved, not that they may be destroyed, but that they may be made new.

91. *Tat.* What then is the operation of Life? Is it not Motion?

92. *Herm.* And what is there in the World unmoveable? Nothing at all, O Son.

93. *Tat.* Why, doth not the Earth seem unmoveable to thee, O Father?

94. *Herm.* No, but subject to many motions, though after a maner, it alone be stable.

95. What a ridiculous thing it were, that the Nurse of all things should be unmoveable, which beareth and bringeth forth all things?

96. For it is impossible that any thing that bringeth forth, should bring forth without Motion.

97. And a ridiculous question it is, Whether the fourth part of the whole, be idle: For the word immoveable, or without Motion, signifies nothing else, but idleness.

98. Know generally, O Son, That whatsoever is in the World, is moved either according to Augmentation or Diminution.

99. But that which is moved, liveth also, yet it is not necessary, that a living thing should be or continue the same.

100. For while the whole World is together, it is unchangeable, O Son, but all the parts thereof are changeable.

101. Yet nothing is corrupted or destroyed, and quite abolished, but the names trouble men.

102. For Generation is not Life, but Sense; neither is Change Death, but Forgetfulness, or rather Occultation, and lying hid.

[] Or better thus.

102. *For Generation is not a Creation of Life, but a production of things to Sense, and making them manifest. Neither is Change Death, but an occultation or hiding of that which was.* []

103. These things being so, all things are Immortal, Matter, Life, Spirit, Soul, Minde, whereof every living thing consisteth.

104. Every living thing therefore, is Immortal, because of the Minde, but especially Man, who both receiveth God, and converseth with him.

105. For with this living wight alone is God familiar; in the night by dreams, in the day by Symbols or Signes.

106. And by all things doth he foretel him of things to come, by Birds, by Fowls, by the Spirit, or Wind, and by an Oke.

107. Wherefore also Man professeth to know things that have been, things that are present, and things to come.

108. Consider this also, O Son, That every other living Creature

goeth upon one part of the World, Swiming things in the Water, Land wights upon the Earth, Flying Fowls in the Air.

109. But Man useth all these, the Earth, the Water, the Air, and the Fire, nay, he seeth and toucheth Heaven by his Sense.

110. But God is both about all things, and through all things; for he is both Act and Power.

111. And it is no hard thing, O Son, to understand God.

112. And if thou wilt also see him, look upon the Necessity of things that appear, and the Providence of things that have been, and are done.

113. See the Matter being most full of Life, and so great a God moved with all Good, and Fair, both Gods, and *Demons*, and Men.

114. *Tat.* But these, O Father, are wholly Acts, or Operations.

115. *Herm.* If they be therefore wholly Acts or Operations, O Son, by whom are they acted or operated, but by God?

116. Or art thou ignorant, that as the parts of the World, are Heaven, and Earth, and Water, and Air; after the same maner the Members of God, are Life, and Immortality, and Eternity, and Spirit, and Necessity, and Providence, and Nature, and Soul, and Minde, and the Continuance or Perseverance of all these which is called Good.

117. And there is not any thing of all that hath been, and all that is, where God is not.

118. *Tat.* What, in the Matter, O Father?

119. *Herm.* The Matter, Son, what is it without God, that thou shouldst ascribe a proper place to it?

120. Or what dost thou think it to be? peradventure some heap that is not actuated or operated.

121. But if it be actuated, by whom is it actuated? for we have said, that Acts or Operations, are the parts of God.

122. By whom are all living things quickned? and the Immortal, by whom are they immortalized? the things that are changeable, by whom are they changed.

123. Whether thou speak of Matter, or Body, or Essence, know that all these are acts of God.

124. And that the Act of Matter is materiality, and of the Bodies corporality, and of Essence essentiality; and this is God the whole.

125. And in the whole, there is nothing that is not God.

126. Wherefore about God, there is neither Greatness, Place, Quality, Figure, or Time; for he is All, and the All, through all, and about all.

127. This Word, O Son, worship and adore. And the onely service of God, is not to be evil.

(*The end of the eleventh Book.*)

THE TWELFTH BOOK OF HERMES TRISMEGISTUS: HIS CRATER OR MONAS.

1. The Workman made this Universal World, not with his Hands, but his Word.

2. Therefore thus think of him, as present every where, and being always, and making all things; and one above, that by his Will hath framed the things that are.

3. For that is his Body, not tangible, nor visible, nor measurable, nor extensible, nor like any other body.

4. For it is neither Fire, nor Water, nor Air, nor Wind, but all these things are of him; for being Good, he hath dedicated that name unto himself alone.

5. But he would also adorn the Earth, but with the Ornament of a Divine Body.

6. And he sent Man an Immortal, and a Mortal Wight.

7. And Man had more then all living Creatures, and the World; because of his Speech, and Minde.

8. For Man became the spectator of the Works of God, and wondered, and acknowledged the Maker.

9. For he divided Speech among all men, but not Minde, and yet he envied not any; for Envy comes not thither, but is of abode here below in the Souls of men, that have not the Minde.

10. *Tat.* But wherefore, Father, did not God distribute the Minde to all men?

11. *Herm.* Because it pleased him, O Son, to set that in the middle among all souls, as a reward to strive for.

12. *Tat.* And where hath he set it?

13. *Herm.* Filling a large Cup or Bowl therewith, he sent it down, giving also a Cryer or Proclaimer.

14. And he commanded him to proclaim these things to the souls of men:

15. Dip and wash thy self, thou that art able in this Cup or Bowl; Thou that beleevest that thou shalt return to him that sent this Cup; thou that acknowledgest whereunto thou wert made.

16. As many therefore as understood the Proclamation, and were baptized or dowsed into the Minde, these were made partakers of Knowledg, and became perfect men, receiving the Minde.

17. But as many as missed of the Proclamation, they received Speech, but not Minde; being ignorant whereunto they were made, or by whom.

18. But their Senses are just like to bruit Beasts, and having their temper in Anger and Wrath, they do not admire the things worthy of looking on.

19. But wholly addicted to the pleasures and desires of the Bodies, they beleeve that man was made for them.

20. But as many as partook of the gift of God; these, O *Tat*, in comparison of their works, are rather immortal then mortal men.

21. Comprehending all things in their Minde, which are upon Earth, which are in Heaven, and if there be any thing above Heaven.

22. And lifting up themselves so high, they see the Good; and seeing it, they account it a miserable calamity to make their abode here.

23. And despising all things bodily and unbodily, they make hast to the *One and Onely.*

24. Thus, O *Tat*, is the Knowledg of the Minde, the beholding of Divine things, and the Understanding of God, the Cup it self being Divine.

25. *Tat.* And I, O Father, would be baptized and drenched therein.

26. *Herm.* Except thou first hate thy body, O Son, thou canst not love thy self; but loving thy self, thou shalt have the Minde, and having the Minde, thou shalt also partake the Knowledg or Science.

27. *Tat.* How meanest thou that, O Father?

28. *Herm.* Because it is impossible, O Son, to be conversant about things Mortal and Divine.

29. For the things that are, being two Bodies, and things incorporeal, wherein is the Mortal and the Divine, the Election or Choice of either is left to him that will chuse: For no man can chuse both.

30. And of which soever the choice is made, the other being diminished or overcome, magnifieth the act and operation of the other.

31. The choice of the better therefore, is not onely best for him that chuseth it, by deifying a man; but it also sheweth Piety and Religion towards God.

32. But the choice of the worse destroyes a man, but doth nothing against God; save that as *Pomps* or *Pageants*, when they come abroad, cannot do any thing themselves but hinder; after the same maner also do these make *Pomps* or *Pageants* in the World, being seduced by the pleasures of the Body.

33. These things being so, O *Tat*, that things have been, and are so plenteously ministred to us from God; let them proceed also from us, without any scarcity or sparing.

34. For God is innocent or guiltless, but we are the causes of Evil, prefering them before the Good.

35. Thou seest, O Son, how many Bodies we must go beyond, and how many Quiers of *Demons*, and what continuity and courses of Stars, that we may make hast to the One, and onely God.

36. For the Good is not to be transcended, it is unbounded and infinite; unto it self without beginning, but unto us, seeming to have a beginning, even our knowledg of it.

37. For our knowledg is not the beginning of it, but shews us the beginning of its being known unto us.

38. Let us therefore lay hold of the beginning, and we shall quickly go through all things.

39. It is indeed a difficult thing, to leave those things that are accustomable, and present, and turn us to those things that are ancient, and according to the original.

40. For these things that appear, delight us, but make the things that appear not, hard to beleeve, *or the things that appear not, are hard to beleeve.*

41. The things most apparent are Evil, but the Good is secret,

or hid in, or to the things that appear; for it hath neither Form nor Figure.

42. For this cause it is like to it self, but unlike every thing else; for it is impossible, that any thing incorporeal, should be made known, or appear to a Body.

43. For this is the difference between the like and the unlike; and the unlike wanteth always somewhat of the like.

44. For the Unity, Beginning, and Root of all things, as being the Root and Beginning.

45. Nothing is without a beginning, but the Beginning is of nothing, but of it self; for it is the Beginning of all other things.

46. Therefore it is, seeing it is not from another beginning.

47. Unity therefore being the Beginning, containeth every number; but it self is contained of none, and begetteth every number, it self being begotten of no other number.

48. Every thing that is begotten (or made) is imperfect, and may be divided, increased, diminished.

49. But to the perfect, there happeneth none of these.

50. And that which is increased, is increased by Unity, but is consumed and vanished through weakness, being not able to receive the Unity.

51. This Image of God, have I described to thee, O *Tat*, as well as I could; which if thou do diligently consider, and view by the eyes of thy minde, and heart, beleeve me, Son, thou shalt finde the way to the things above, or rather the Image it self will lead thee.

52. But the spectacle or sight, hath this peculiar and proper: Them that can see, and behold it, it holds fast and draws unto it, as they say, the Loadstone doth Iron.

(*The end of the twelfth Book.*)

THE THIRTEENTH BOOK OF HERMES TRISMEGISTUS: OF SENSE AND UNDERSTANDING.

1. Yesterday, *Asclepius*, I delivered a perfect Discourse; but now I think it necessary, in suite of that, to dispute also of Sense.

2. For Sense and Understanding seem to differ, because the one is material, the other essential.

3. But unto me, they appear to be both one, or united, and not divided in men, I mean.

4. For in other living Creatures, Sense is united unto Nature, but in men to Understanding.

5. But the Minde differs from Understanding, as much as God from Divinity.

6. For Divinity is (ὑπὸ) from or under God, and Understanding from the Minde, being the sister of the Word or Speech, and they the Instruments one of another.

7. For neither is the Word pronounced without Understanding, neither is Understanding manifested without the Word.

8. Therefore Sense and Understanding do both flow together into a man, as if they were infolded one within another.

9. For neither is it possible without Sense to Understand, nor can we have Sense without Understanding.

10. And yet it is possible (*for the time being*) that the Understanding may understand without Sense, as they that fantasie Visions in their Dreams.

11. But it seems unto me, that both the operations are in the Visions of Dreams, and that the Sense is stirred up out of sleep, unto awaking.

12. For man is divided into a Body and a Soul; when both parts of the Sense accord one with another, then is the Understanding childed, or brought forth by the Minde pronounced.

13. For the Minde brings forth all Intellections or Understandings: Good ones, when it receiveth good Seed from God; and the contrary, when it receives them from Devils.

14. For there is no part of the World voyd of the Devil, which entering in privately, sowed the seed of his own proper operation; and the Minde did make pregnant, or did bring forth that which was sown, *Adulteries*, *Murthers*, *Striking of Parents*, *Sacriledges*, *Impieties*, *Stranglings*, throwing down headlong, and all other things which are the works of evil *Demons*.

15. And the Seeds of God are few but Great, and Fair, and Good, Vertue, and Temperance, and Piety.

16. And the Piety is the Knowledg of God, whom whosoever knoweth being full of all good things, hath Divine Understanding, and not like the Many.

17. And therefore they that have that Knowledg, neither please

the multitude, nor the multitude them, but they seem to be mad, and to move laughter, hated and despised, and many times also murthered.

18. For we have already said, That wickedness must dwell here, being in her own region.

19. For her region is the Earth, and not the World, as some will sometimes say, Blaspheming.

20. But the godly or God-worshiping Man laying hold on Knowledg, will despise or tread under all these things; for though they be evil to other men, yet to him all things are good.

21. And upon mature consideration, he refers all things to Knowledg, and that which is most to be wondred at, he alone makes evil things good.

22. But I return again to my Discourse of Sense.

23. It is therefore a thing proper to Man, to communicate and conjoyn Sense and Understanding.

24. But every man, as I said before, doth not enjoy Understanding; for one man is material, another essential.

25. And he that is material with wickedness, as I said, received from the Devils the Seed of Understanding; but they that are with the Good essentially, are saved with God.

26. For God is the Workman of all things; and when he worketh, he useth Nature.

27. He maketh all things good like himself.

28. But these things that are made good, are in the use of Operation unlawful.

29. For the Motion of the World stirring up Generations, makes Qualities; infecting some with evilness, and purifying some with good.

30. And the World, *Asclepius*, hath a peculiar Sense and Understanding, not like to Mans, nor so various or manifold, but a better and more simple.

31. For the Sense and Understanding of the World is One, in that it makes all things, and unmakes them again into it self; for it is the Organ or Instrument of the Will of God.

32. And it is so organized or framed, and made for an Instrument by God; that receiving all Seeds into it self from God, and keeping them in it self, it maketh all things effectually, and dissolving them, reneweth all things.

33. And therefore like a good Husband-man of Life, when things are dissolved or loosened, he affords by the casting of Seed, renovation to all things that grow.

34. There is nothing that it (the World) doth not beget or bring forth alive; and by its Motion, it makes all things alive.

35. And it is at once, both the Place and the Workman of Life.

36. But the Bodies are from the Matter, in a different maner; for some are of the Earth, some of Water, some of Air, some of Fire, and all are compounded, but some are more compounded, and some are more simple.

37. They that are compounded, are the heavier, and they that are less, are the higher.

38. And the swiftness of the Motion of the World, makes the varieties of the Qualities of Generation; for the spiration or influence, being most frequent, extendeth unto the Bodies qualities, with one fulness, which is of Life.

39. Therefore, God is the Father of the World, but the World is the Father of things in the World.

40. And the World is the Son of God, but things in the World are the Sons of the World.

41. And therefore it is well called κόσμος, the World, that is an Ornament, because it adorneth and beautifieth all things with the variety of Generation, and indeficiency of Life, which the unweariedness of Operation, and the swiftness of Necessity, with the mingling of Elements, and the order of things done.

42. Therefore it is necessarily, and properly called κόσμος, the World.

43. For of all living things, both the Sense, and the Understanding, cometh into them from without, inspired by that which compasseth them about, and continueth them.

44. And the World receiving it once from God as soon as it was made, hath it still, *what ever it once had.*

45. But God is not as it seems to some who Blaspheme through superstition, without Sense, and without Minde, or Understanding.

46. For all things that are, O *Asclepius*, are in God, and made by him, and depend of him, some working by Bodies, some moving by a Soul-like Essence, some quickning by a Spirit, and some receiving the things that are weary, and all very fitly.

47. Or rather, I say, that he hath them not, but I declare the Truth; *he is all things*, not receiving them from without, but exhibiting them outwardly.

48. And this is the Sense and Understanding of God, to move all things always.

49. And there shall never be any time, when any of those things that are, shall fail or be wanting.

50. When I say the things that are, I mean God; for the things that are, God hath; and neither is there any thing without him, nor he without any thing.

51. These things, O *Asclepius*, will appear to be true, if thou understand them; but if thou understand them not, incredible.

52. For to understand, is to beleeve; but not to beleeve, is not to understand: For my speech or words reach not unto the Truth, but the Minde is great, and being led or conducted for a while by Speech, is able to attain to the Truth.

53. And understanding all things round about, and finding them consonant, and agreeable to those things that were delivered, and interrupted by Speech, beleeveth; and in that good belief, resteth.

54. To them therefore that understand the things that have been said of God, they are credible; but to them that understand them not, incredible.

55. And let these, and thus many things, be spoken concerning *Understanding* and *Sense*.

(*The end of the thirteenth Book.*)

THE FOURTEENTH BOOK OF HERMES TRISMEGISTUS: OF OPERATION AND SENSE.

1. *Tat.* Thou hast well explained these things, Father: Teach me furthermore these things; for thou sayest, that *Science* and *Art* were the Operations of the rational, but now thou sayest, that Beasts are unreasonable, and for want of reason, both are, and are called Bruits; so that by this Reason, it must needs follow, that unreasonable Creatures partake not of Science, or Art, because they come short of Reason.

2. *Herm.* It must needs be so Son.

3. *Tat.* Why then, O Father, do we see some unreasonable liv-

ing Creatures use both Science and Art? as the *Pismires* treasure up for themselves food against the Winter, and Fowls of the Air likewise make them Nests, and four-footed Beasts know their own Dens.

4. These things they do, O Son, not by Science or Art, but by Nature; for Science and Art are things that are taught, but none of these bruit Beasts are taught any of these things.

5. But these things being Natural unto them, are wrought by Nature, whereas Art and Science do not happen unto all, but unto some.

6. As men are Musitians, but not all; neither are all Archers, or Huntsmen, or the rest, but some of them have learned something by the working of Science or Art.

7. After the same maner also, if some *Pismires* did so, and some not, thou mightest well say, they gather their Food according to Science and Art.

8. But being they are all led by Nature, to the same thing, even against their wills, it is manifest they do not do it by Science or Art.

9. For Operations, O *Tat*, being unbodily, are in Bodies, and work by Bodies.

10. Wherefore, O *Tat*, in as much as they are unbodily, thou must needs say they are immortal.

11. But in as much as they cannot act without Bodies, I say, they are always in a Body.

12. For those things that are to any thing, or for the cause of any thing made subject to Providence or Necessity, cannot possibly remain idle of their own proper Operation.

13. For that which is, shall ever be; for both the Body, and the Life of it, is the same.

14. And by this reason, it follows, that the Bodies also are always, because I affirm That this corporiety is always by the Act and Operation, or for them.

15. For although earthly bodies be subject to dissolution; yet these bodies must be the Places, and the Organs, and Instruments of Acts or Operations.

16. But Acts or Operations are immortal, and that which is immortal, is always in Act, and therefore also *Corporification* if it be always.

17. Acts or Operations do follow the Soul, yet come not suddenly or promiscuously; but some of them come together with being made man, being about bruitish or unreasonable things.

18. But the purer Operations do insensibly in the change of time, work with the oblique part of the Soul.

19. And these Operations depend upon Bodies; and truly they that are *Corporifying*, come from the Divine Bodies into Mortal ones.

20. But every one of them acteth both about the Body and the Soul, and are present with the Soul, even without the Body.

21. And they are always Acts or Operations, but the Soul is not always in a Mortal Body, for it can be without a Body, but Acts or Operations cannot be without Bodies.

22. This is a sacred speech, Son, *The Body cannot consist without a Soul.*

23. *Tat.* How meanest thou that, Father?

24. *Herm.* Understand it thus, O *Tat*, When the Soul is separated from the Body, there remaineth that same Body.

25. And this same Body according to the time of its abode, is actuated or operated in that it is dissolved, and becomes invisible.

26. And these things the Body cannot suffer without act or operation, and consequently there remaineth with the Body the same act or operation.

27. This then is the difference between an Immortal Body, and a Mortal one, that the immortal one consists of one Mater, and so doth not the mortal one; and the immortal one doth, but this suffereth.

28. And every thing that acteth or operateth, is stronger, and ruleth, but that which is actuated or operated, is ruled.

29. And that which ruleth, directeth, and governeth as free, but the other is ruled a servant.

30. Acts or Operations do not onely actuate or operate, living or breathing, or insouled (ἔμψυχα) Bodies, but also breathless Bodies or without Souls, Wood, and Stones, and such like encreasing and bearing fruit, ripening, corrupting, rotting, putrifying, and breaking, or working such-like things, and whatsoever inanimate Bodies can suffer.

31. Act or Operation, O Son, is called, whatsoever is, or is

made or done; and there are always many things made, or rather all things.

32. For the World is never widowed or forsaken of any of those things that are; but being alway carried or moved in it self, it is in labor to bring forth the things that are, which shall never be left by it to corruption.

33. Let therefore every act or operation be understood to be always immortal, in what maner of Body soever it be.

34. But some Acts or Operations be of Divine, some of corruptible Bodies, some universal, some peculiar, and some of the generals, and some of the parts of every thing.

35. Divine Acts or Operations therefore there be, and such as work or operate upon their proper Bodies, and these also are perfect, and being upon or in perfect Bodies.

36. Particular, are they which work by any of the living Creatures.

37. Proper, be they that work upon any of the things that are.

38. By this Discourse therefore, O Son, it is gathered that all things are full of Acts or Operations.

39. For if necessarily they be in every Body, and that there be many Bodies in the World, I may very well affirm, that there be many other Acts or Operations.

40. For many times in one Body, there is one, and a second, and a third, besides these universal ones that follow.

41. And universal Operations, I call them that are indeed bodily, and are done by the Senses and Motions.

42. For without these it is impossible that the Body should consist.

43. But other Operations are proper to the Souls of Men, by Arts, Sciences, Studies, and Actions.

44. The Senses also follow these Operations, or rather are the effects or perfections (*ἀποτελέσματα*) of them.

45. Understand therefore, O Son, the difference of Operations, it is sent from above.

46. But Sense being in the Body, and having its essence from it, when it receiveth Act or Operation, manifesteth it, making it as it were corporeal.

47. Therefore, I say, that the Senses are both corporeal and

mortal, having so much existence as the Body, for they are born with the Body, and die with it.

48. But mortal things themselves have not Sense, as *not* consisting of such an Essence.

49. For Sense can be no other then a corporeal apprehension, either of evil or good that comes to the Body.

50. But to Eternal Bodies there is nothing comes, nothing departs; therefore there is no Sense in them.

51. *Tat.* Doth the Sense therefore perceive or apprehend in every Body?

52. *Herm.* In every Body, O Son.

53. *Tat.* And do the Acts or Operations work in all things?

54. *Herm.* Even in things inanimate, O Son, but there are differences of Senses.

55. For the Senses of things rational, are with Reason; of things unreasonable, Corporeal onely; but the Senses of things inanimate, are passive onely, according to Augmentation and Diminution.

56. But Passion and Sense depend both upon one head, or height, and are gathered together into the same, by Acts or Operations.

57. But in living wights there be two other Operations that follow the Senses and Passions, to wit, *Grief* and *Pleasure.*

58. And without these, it is impossible that a living wight, especially a reasonable one should perceive or apprehend.

59. And therefore, I say, that these are the *Ideas* of Passions that bear rule, especially in reasonable living wights.

60. The Operations work indeed, but the Senses do declare and manifest the Operations, and they being bodily, are moved by the bruitish parts of the Soul; therefore, I say, they are both maleficial or doers of evil.

61. For that which affords the Sense to rejoyce with Pleasure, is straightway the cause of many evils happening to him that suffers it.

62. But Sorrow gives stronger torments and Anguish, therefore doubtless are they both maleficial.

63. The same may be said of the Sense of the Soul.

64. *Tat.* Is not the Soul incorporeal, and the Sense a Body, Father? or is it rather in the Body?

65. *Herm.* If we put it in a Body, O Son, we shall make it like the Soul or the Operations. For these being unbodily, we say are in Bodies.

66. But Sense is neither Operation, nor Soul, nor any thing else that belongs to the Body; but as we have said, and therefore it is not incorporeal.

67. And if it be not incorporeal it must needs be a Body; for we always say, that of things that are, some are Bodies, and some incorporeal.

(*The end of the fourteenth Book.*)

THE FIFTEENTH BOOK OF HERMES TRISMEGISTUS: OF TRUTH TO HIS SON TAT.

1. *Herm.* Of Truth, O *Tat*, it is not possible that man being an imperfect wight, compounded of imperfect Members, and having his Tabernacle, consisting of different and many Bodies, should speak with any confidence.

2. But as far as it is possible, and just, I say, That Truth is onely in the Eternal Bodies, whose very Bodies be also true.

3. The Fire is fire it self onely, and nothing else; the Earth is earth it self, and nothing else; the Air is air it self, and nothing else; the Water, water it self, and nothing else.

4. But our Bodies consist of all these; for they have of the Fire, they have of the Earth, they have of the Water, and Air, and yet there is neither Fire, nor Earth, nor Water, nor Air, nor any thing true.

5. And if at the beginning, our Constitution had not Truth, how could men either see the Truth, or speak it, or understand it onely, except God would?

6. All things therefore upon Earth, O *Tat*, are not Truth, but imitations of the Truth; and yet not all things neither, for they are but few that are so.

7. But the other things are Falshood, and Deceit, O *Tat*, and Opinions like the Images of the fantasie or appearance.

8. And when the fantasie hath an influence from above, then it is an imitation of Truth, but without that operation from above, it is left a lye.

9. And as an Image shews the Body described, and yet is not

the Body of that which is seen, as it seems to be; and it is seen to have eyes, but it sees nothing, and ears, but hears nothing at all; and all other things hath the picture, but they are false, deceiving the eyes of the beholder, whilest they think they see the Truth, and yet they are indeed but lies.

10. As many therefore as see not Falshood, see the Truth.

11. If therefore we do so understand, and see every one of these things as it is, then we see and understand true things.

12. But if we see or understand any thing besides, or otherwise, then that which is, we shall neither understand, nor know the Truth.

13. *Tat.* Is Truth therefore upon Earth, O Father?

14. *Herm.* Thou doth not miss the mark, O Son. Truth indeed is no where at all upon Earth, O *Tat*, for it cannot be generated, or made.

15. But concerning the Truth, it may be that some men, to whom God will give the good seeing Power, may understand it.

16. So that unto the Minde and Reason, there is nothing true indeed upon Earth.

17. But unto the true Minde and Reason, all things are fantasies or appearances, and opinions.

18. *Tat.* Must we not therefore call it Truth, to understand and speak the things that are?

19. *Herm.* But there is nothing true upon Earth.

20. *Tat.* How then is this true, That we do not know any thing true? how can that be done here?

21. *Herm.* O Son, Truth is the most perfect Vertue, and the highest Good it self, not troubled by Matter, not encompassed by a Body, naked, clear, unchangeable, venerable, unalterable Good.

22. But the things that are here, O Son, are visible, incapable of Good, corruptible, passible, dissolveable, changeable, continually altered, and made of another.

23. The things therefore that are not true to themselves; how can they be true?

24. For every thing that is altered, is a lie, not abiding in what it is; but being changed it shews us always, other, and other appearances.

25. *Tat.* Is not man true, O Father?

26. *Herm.* As far forth as he is a Man, he is not true, Son; for

that which is true, hath of it self alone its constitution, and remains, and abides according to it self, such as it is.

27. But man consists of many things, and doth not abide of himself; but is turned and changed, age after age, *Idea* after *Idea*, or form after form; and this while he is yet in the Tabernacle.

28. And many have not known their own children after a little while; and many children likewise have not known their own Parents.

29. Is it then possible, O *Tat*, that he who is so changed, is not to be known, should be true? no, on the contrary, he is Falshood, being in many Appearances of changes.

30. But do thou understand the True to be that which abides the same, and is Eternal, but man is not ever, therefore not True; but man is a certain Appearance, and Appearance is the highest Lie or Falshood.

31. *Tat.* But these eternal Bodies, Father, are they not true though they be changed?

32. *Herm.* Every thing that is begotten, or made, and changed, is not true; but being made by our Progenitor, they might have had true Matter.

33. But these also have in themselves, something that is false, in regard of their change.

34. For nothing that remains not in it self, is True.

35. *Tat.* What shall one say then, Father, that onely the Sun, which besides the Nature of other things, is not changed, but abides in it self, is *Truth?*

36. *Herm.* It is Truth, and therefore is he onely intrusted with the Workmanship of the World, ruling and making all things, whom I do both honor, and adore his Truth; and after the *One*, and First, I acknowledg him the Workman.

37. *Tat.* What therefore doth thou affirm to be the first Truth, O Father?

38. *Herm.* The *One* and *Onely*, O *Tat*, that is not of Matter, that is not in a Body, that is without Colour, without Figure or Shape, Immutable, Unalterable, which always is; but Falshood, O Son, is corrupted.

39. And corruption hath laid hold upon all things on Earth, and the Providence of the *True* encompasseth, and will encompass them.

40. For without corruption, there can no Generation consist.

41. For Corruption followeth every Generation, that it may again be generated.

42. For those things that are generated, must of necessity be generated of those things that are corrupted; and the things generated must needs be corrupted, that the Generation of things being, may not stand still or cease.

43. Acknowledg therefore the first Workman by the Generation of things.

44. Consequently the things that are generated of Corruption, are false, as being sometimes one thing, sometimes another: For it is impossible, they should be made the same things again; and that which is not the same, how is it true?

45. Therefore, O Son, we must call these things fantasies or appearances.

46. And if we will give a man his right name, we must call him the appearance of Manhood; and a Childe, the fantasie or appearance of a Childe; an old man, the appearance of an old man; a young man, the appearance of a young man; and a man of ripe age, the appearance of a man of ripe age.

47. For neither is a man, a man; nor a childe, a childe; nor a young man, a young man; nor an old man, an old man.

48. But the things that preexist, and that are, being changed, are false.

49. These things understand thus, O Son, as these false Operations, having their dependance from above, even of the Truth it self.

50. Which being so, I do affirm, that Falshood is the Work of Truth.

(*The end of the fifteenth Book.*)

THE SIXTEENTH BOOK OF HERMES TRISMEGISTUS: THAT NONE OF THE THINGS THAT ARE, CAN PERISH.

1. *Herm.* We must now speak of the Soul and Body, O Son; after what maner the Soul is Immortal; and what operation that is, which constitutes the Body, and dissolves it.

2. But in none of these is Death, for it is a conception of a name, which is either an empty word, or else it is wrongly called Death,

(*θάνατος*) by the taking away the first letter, instead of Immortal (*ἀθάνατος*).

3. For Death is destruction, but there is nothing in the whole World that is destroyed.

4. For if the World be a second God, and an Immortal living Wight, it is impossible that any part of an Immortal living Wight should die.

5. But all things that are in the World, are members of the World, especially Man, the reasonable living Wight.

6. For the first of all is God, the Eternal, and Unmade, and the Workman of all things.

7. The second is the World, made by him, after his own Image, and by him holden together, and nourished, and immortalized; and as from its own Father, ever living.

8. So that as Immortal, it is ever living, and ever immortal.

9. For that which is ever living, differs from that which is eternal.

10. For the Eternal was not begotten, or made by another; and if it were begotten or made, yet it was made by itself, not by any other, but it is always made.

11. For the Eternal, as it is Eternal, is the Universe.

12. For the Father himself, is Eternal of himself; but the World was made by the Father, ever living, and immortal.

13. And as much Mater as there was laid up by him, the Father made it all into a Body, and swelling it, made it round like a Sphere; endued it with Quality, being it self immortal, and having Eternal Materiality.

14. The Father being full of *Ideas*, sowed Qualities in the Sphere, and shut them up, as in a Circle, deliberating to beautifie with every Quality that which should afterwards be made.

15. Then cloathing the Universal Body with Immortality, lest the Matter, if it would depart from this Composition, should be dissolved into its own disorder.

16. For when the Matter was incorporeal, O Son, it was disordered, and it hath here the same confusion daily revolved about other little things, endued with Qualities, in point of Augmentation, and Diminution, which men call Death; being indeed a disorder happening about earthly living wights.

17. For the Bodies of Heavenly things, have one order, which

they have received from the Father at the Beginning, and is by the instauration of each of them, kept indissolveable.

18. But the instauration of earthly Bodies, is their consistence; and their dissolution restores them into indissoluble, that is, Immortal.

19. And so there is made a privation of Sense, but not a destruction of Bodies.

20. Now the third living wight is Man, made after the Image of the World; and having by the Will of the Father, a Minde above other earthly wights.

21. And he hath not onely a sympathy with the second God, but also an understanding of the first.

22. For the second God, he apprehends as a Body; but the first, he understands as Incorporeal, and the Minde of the Good.

23. *Tat.* And doth not this living wight perish?

24. *Herm.* Speak advisedly, O Son, and learn what God is, what the World, what an Immortal Wight, and what a dissolveable One is.

25. And understand that the World is of God, and in God but Man of the World, and in the World.

26. The Beginning, and End, and Consistence of all, is God.

(*The end of the sixteenth Book.*)

THE SEVENTEENTH BOOK OF HERMES TRISMEGISTUS: TO ASCLEPIUS, TO BE TRULY WISE.

1. Because my Son *Tat* in thy absence, would needs learn the Nature of the things that are: He would not suffer me to give over (as coming very young to the knowledg of every individual) till I was forced to discourse to him many things at large, that his contemplation might from point to point, be more easie and successful.

2. But to thee, I have thought good to write in few words, chusing out the principal heads of the things then spoken, and to interpret them more mystically, because thou hast both more yeers and more knowledg of Nature.

3. All things that appear, were made, and are made.

4. Those things that are made, are not made by themselves, but by another.

5. And there are many things made, but especially all things that appear, and which are different, and not like.

6. If the things that be made and done, be made and done by another, there must be one that must make, and do them; and he unmade, and more ancient then the things that are made.

7. For I affirm the things that are made, to be made by another; and it is impossible, that of the things that are made, any should be more ancient then all, but onely that which is not made.

8. He is stronger, and One, and onely knowing all things indeed, as not having any thing more ancient then himself.

9. For he bears rule, both over multitude, and greatness, and the diversity of the things that are made, and the continuity of the Facture, and of the Operation.

10. Moreover, the things that are made, are visible, but he is invisible; and for this cause, he maketh them, that he may be visible; and therefore he makes them always.

11. Thus it is fit to understand, and understanding to admire, and admiring to think thy self happy, that knowest thy natural Father.

12. For what is sweeter then a natural Father?

13. Who therefore is this, or how shall we know him?

14. Or is it just to ascribe unto him alone, the Title and Appellation of God, or of the Maker, or of the Father, or all Three? That of God, because of his Power; the Maker, because of his Working and Operation; and the Father, because of his Goodness?

15. For Power is different from the things that are made, but Act or Operation, in that all things are made.

16. Wherefore, letting go all much and vain talking, we must understand these two things, *That which is made, and him which is the Maker;* for there is nothing in the middle, between these Two, nor is there any third.

17. Therefore understanding All things, remember these Two; and think that these are All things, puting nothing into doubt; neither of the things above, nor of the things below; neither of things changeable, nor things that are in darkness or secret.

18. For All things, are but Two things, *That which maketh, and that which is made;* and the One of them cannot depart, or be divided from the other.

19. For neither is it possible, that the Maker should be without the thing made, for either of them is the self-same thing; therefore cannot the One of them be separated from the other, no more then a thing can be separated from it self.

20. For if he that makes be nothing else, but that which makes alone, *simple*, *uncompounded*, it is of necessity, that he makes the same thing to himself, to whom it is the Generation of him that maketh to be also All that is made.

21. For that which is generated or made, must necessarily be generated or made by another, but without the Maker that which is made, neither is made, nor is; for the one of them without the other, hath lost his proper Nature by the privation of the other.

22. So if these Two be confessed, That which maketh, and that which is made, then they are One in Union, this going before, and that following.

23. And that which goeth before, is God the Maker; and that which follows, is that which is made, be it what it will.

24. And let no man be afraid, because of the variety of things that are made or done, lest he should cast an aspersion of baseness, or infamy upon God; for it is the onely Glory of him to do, or make All things.

25. And this making, or facture, is as it were the Body of God; and to him that maketh, or doth, there is nothing evil, or filthy to be imputed, *or there is nothing thought evil, or filthy.*

26. For these are Passions that follow Generation, as Rust doth Copper, or as Excrements do the Body.

27. But neither did the Coppersmith make the Rust, nor the Maker the Filth, nor God the Evilness.

28. But the vicissitude of Generation doth make them, as it were to blossom out; and for this cause did make Change to be, as one should say, The Purgation of Generation.

29. Moreover, is it lawful for the same Painter to make both Heaven, and the Gods, and the Earth, and the Sea, and Men, and bruite Beasts, and inanimate Things, and Trees; and is it impossible for God to make these things? O the great madness, and ignorance of men in things that concern God!

30. For men that think so, suffer that which is most ridiculous of all; for professing to bless, and praise God, yet in not ascribing to him the making or doing of All things, they know him not.

31. And besides their not knowing him, they are extreamly impious against him, attributing unto him Passions, as Pride, or *Oversight*, or Weakness, or Ignorance, or Envy.

32. For if he do not make, or do all things, he is either proud, or not able, or ignorant, or envious, which is impious to affirm.

33. For God hath onely one Passion, namely, Good; and he that is good, is neither proud, nor impotent, nor the rest, but God is Good it self.

34. For *Good* is all *Power*, to do or make all things, and every thing that is made, is made by God; that is, by the Good, and that can make, or do all things.

35. See then how he maketh all things, and how the things are done, that are done; and if thou wilt learn, thou mayest see an Image thereof, very beautiful, and like.

36. Look upon the Husbandman, how he casteth Seeds into the Earth, here Wheat, there Barly, and elsewhere some other Seeds.

37. Look upon the same Man, planting a vine, or an apple tree, or a fig tree or some other tree.

38. So doth God in Heaven sowe Immortality, in the Earth Change in the whole Life and Motion.

39. And these things are not many, but few and easily numbred; for they are all but four, God and Generation, in which are all things.

(*The end of the seventeenth Book.*)

FINIS.

THE TITLES OF EVERY BOOK OF HERMES TRISMEGISTUS.

LIBER		FOLIO
1.	His first Book	227
2.	Poemander	232
3.	The holy Sermon	240
4.	The Key	242
5.	That God is not manifest, and yet most manifest	250
6.	That in God alone is good	253
7.	The secret Sermon in the Mount, of Regeneration, and the Profession of Silence	256
8.	That the greatest evil in Man, is, the not knowing God	263
9.	A Universal Sermon to Asclepius	264
10.	The Minde to Hermes	337

LIBER		FOLIO
11.	Of the common minde to Tat	345
12.	Hermes Trismegistus, his Crater or Monas	353
13.	Of Sense and Understanding	356
14.	Of Operation and Sense.	360
15.	Of Truth to his son Tat.	365
16.	That none of the things that are, can perish	368
17.	To Asclepius, to be truly wise	370

NOTE BY THE EDITOR.—The earliest mention of this work is by Clemens Alexandrinus, in the second century, A. D. (Stromata, VI, where forty-two of the works of Hermes Trismegistus are mentioned). The Pymander [Pimander or Poimander] has been attributed to Apuleius of Medaura in Numidia, who lived in the time of Clement, but zealous disciples assert for it a fabulous antiquity, as one may see from the preface to the work (reprinted at the beginning). Critics find it to be no earlier than the second century. Its allusions to gnostic and neo-Platonist speculations, and its implication of Christian doctrines, make an earlier date impossible. Ficinus translated it into Latin in 1471, dividing it into fourteen books. The present translation bears internal evidence of being printed from the manuscript of Dr. Everard after his death, and without careful editing. Sometimes the translator's marginal notes appear to have crept into the text, and more than once the second and revised version of a passage is printed after the first without a sufficient explanation (see Book XI, paragraph 102, for an example of this). The book has been recently reprinted in London (1884)—"Two hundred copies published (only for subscribers), and all rights secured by Robert H. Fryar, Bath." It is reprinted like the one here given, from the edition of 1650, and, although some of the spelling is modernized, most of the typographical errors of the first edition are preserved, while many new ones are added. For an example of the more serious of these new errata, take the following: Book XI, 80, "concerning" for "conserving"; XII, 30, "or" for "and"; 32, "worst" for "worse," "or" for "and"; 51, "hear" for "heart"; XIII, 5, "a" for "as"; 25, "eared" for "saved"; 29, "infesting" for "infecting"; 38, "infulness" for "one fulness"; XIV, 50, "external" for "eternal." The Greek quotations are also frequently misprinted.—W. T. H.

THE PERCEPTION OF TIME.

> "Qu'on ne cherche point la durée dans la succession; on ne l'y trouvera jamais; la durée a précédé la succession; la notion de la durée a précéd é la notion de la succession. Elle en est donc tout-à-fait indépendante, dira-t-on? Oui, elle en est tout-à-fait indépendante."
>
> ROYER-COLLARD.

If the constitution of consciousness were that of a string of bead-like sensations and images, all separate, "we never could

have any knowledge except that of the present instant. The moment each of our sensations ceased it would be gone forever; and we should be as if we had never been. . . . We should be wholly incapable of acquiring experience. . . . Even if our ideas were associated in trains, but only as they are in imagination, we should still be without the capacity of acquiring knowledge. One idea, upon this supposition, would follow another. But that would be all. Each of our successive states of consciousness, the moment it ceased, would be gone forever. Each of those momentary states would be our whole being." [1]

We might, nevertheless, under these circumstances, *act* in a rational way, provided the mechanism which produced our trains of images produced them in a rational order. We should make appropriate speeches, though unaware of any word except the one just on our lips; we should decide upon the right policy without ever a glimpse of the total grounds of our choice. Our consciousness would be like a glow-worm spark, illuminating the point it immediately covered, but leaving all beyond in total darkness. Whether a very highly developed practical life be possible under such conditions as these is more than doubtful; it is, however, conceivable.

I make the fanciful hypothesis merely to set off our real nature by the contrast. Our feelings are not thus contracted, and our consciousness never shrinks to the dimensions of a glow-worm spark. The knowledge of some other part of the stream, past or future, near or remote, is always mixed in with our knowledge of the present thing.

A simple sensation is a pure fiction, and all our experienced states of mind are representations of objects with some amount of complexity. Part of the complexity is the echo of the objects just past, and, in a less degree, perhaps, the foretaste of those just to arrive. Objects fade out of consciousness slowly. If the present thought is of A B C D E F G, the next one will be of B C D E F G H, and the one after that of C D E F G H I—the lingerings of the past dropping successively away, and the incomings of the future making up the loss. These lingerings of old objects, these incomings of new, are the germs of memory and expectation, the

[1] James Mill, "Analysis," vol. i, p. 319 (J. S. Mill's Edition).

retrospective and the prospective sense of time. They give that continuity to consciousness, without which it could not be called a stream.[1]

[1] "What I find, when I look at consciousness at all, is, that what I cannot divest myself of, or not have in consciousness, if I have consciousness at all, is a sequence of different feelings. . . . The simultaneous perception of both sub-feelings, whether as parts of a coexistence or of a sequence, is the total feeling—the minimum of consciousness—and this minimum has duration. . . . Time-duration, however, is inseparable from the minimum, notwithstanding that, in an isolated moment, we could not tell which part of it came first, which last. . . . We do not require to know that the sub-feelings come in sequence, first one, then the other; nor to know what coming in sequence means. But we have, in any artificially isolated minimum of consciousness, the *rudiments* of the perception of former and latter in time, in the sub-feeling that grows fainter, and the sub-feeling that grows stronger, and the change between them. . . .

"In the next place, I remark that the rudiments of memory are involved in the minimum of consciousness. The first beginnings of it appear in that minimum, just as the first beginnings of perception do. As each member of the change or difference which goes to compose that minimum is the rudiment of a single perception, so the priority of one member to the other, although both are given to consciousness in one empirical present moment, is the rudiment of memory. The fact that the minimum of consciousness is difference or change in feelings, is the ultimate explanation of memory as well as of single perceptions. A former and a latter are included in the minimum of consciousness; and this is what is meant by saying that all consciousness is in the form of *time*, or that time is the form of feeling, the form of sensibility. Crudely and popularly we divide the course of time into past, present, and future; but, strictly speaking, there is no present; it is composed of past and future divided by an indivisible point or instant. That instant, or time-point, is the strict *present*. What we call, loosely, the present, is an empirical portion of the course of time, containing at least the minimum of consciousness, in which the instant of change is the present time-point. . . . If we take this as the present time-point, it is clear that the minimum of feeling contains two portions—a sub-feeling that goes and a sub-feeling that comes. One is remembered, the other imagined. The limits of both are indefinite at beginning and end of the minimum, and ready to melt into other minima, proceeding from other stimuli.

"Time and consciousness do not come to us ready marked out into minima; we have to do that by reflection, asking ourselves, What is the least empirical moment of consciousness? That least empirical moment is what we usually call the present moment; and even this is too minute for ordinary use; the present moment is often extended practically to a few seconds, or even minutes, beyond which we specify what length of time we mean, as the present hour, or day, or year, or century.

"But this popular way of thinking imposes itself on great numbers even of philosophically-minded people, and they talk about the *present* as if it was a *datum*—as if time came to us marked into present periods like a measuring-tape." (S. H. Hodgson: "Philosophy of Reflection," vol. i, pp. 248–254.)

"The representation of time agrees with that of space in that a certain amount of it must be presented together—included between its initial and terminal limit. A continuous ideation, flowing from one point to another, would indeed *occupy* time, but not *represent* it, for it would exchange one element of succession for another instead of

Let any one try, I will not say, to arrest, but to notice or attend to, the *present* moment of time. One of the most baffling experiences occurs. Where is it, this present? It has melted in our grasp, fled ere we could touch it, gone in the instant of becoming. As a poet, quoted by Mr. Hodgson, says,

"Le moment où je parle est déjà loin de moi,"

and it is only as entering into the living and moving organization of a much wider tract of time that the strict present is apprehended at all. It is, in fact, an altogether ideal abstraction, not only never realized in sense, but probably never even conceived of by those unaccustomed to philosophic meditation. Reflection leads us to the conclusion that it *must* exist, but that it *does* exist can never be a fact of our immediate experience. The only fact of our immediate experience is what Mr. E. R. Clay has well called "the *specious* present." His words deserve to be quoted in full:[1]

"The relation of experience to time has not been profoundly studied. Its objects are given as being of the present, but the part of time referred to by the datum is a very different thing from the conterminous of the past and future which philosophy

[1] "The Alternative," p. 167.

grasping the whole succession at once. Both points—the beginning and the end—are equally essential to the conception of time, and must be present with equal clearness together." (Herbart: "Psychol. als W.," § 115.)

"Assume that . . . similar pendulum-strokes follow each other at regular intervals in a consciousness otherwise void. When the first one is over, an image of it remains in the fancy until the second succeeds. This, then, reproduces the first by virtue of the law of association by similarity, but at the same time meets with the aforesaid persisting image. . . . Thus does the simple repetition of the sound provide all the elements of time-perception. The first sound [as it is recalled by association] gives the beginning, the second the end, and the persistent image in the fancy represents the length of the interval. At the moment of the second impression, the entire time-perception exists at once, for then all its elements are presented together, the second sound and the image in the fancy immediately, and the first impression by reproduction. But, in the same act, we are aware of a state in which only the first sound existed, and of another in which only its image existed in the fancy. Such a consciousness as this *is* that of time. . . . *In it no succession of ideas takes place.*" (Wundt: "Physiol. Psych.," 1st ed., p. 681–2.) Note here the assumption that the *persistence* and the *reproduction* of an impression are two processes which may go on simultaneously. Also that Wundt's description is merely an *attempt to analyze the* "*deliverance*" of a time-perception, and no *explanation of the manner in which it comes about.*

denotes by the name Present. The present to which the datum refers is really a part of the past — a recent past — delusively given as being a time that intervenes between the past and the future. Let it be named the specious present, and let the past, that is given as being the past, be known as the obvious past. All the notes of a bar of a song seem to the listener to be contained in the present. All the changes of place of a meteor seem to the beholder to be contained in the present. At the instant of the termination of such series, no part of the time measured by them seems to be a past. Time, then, considered relatively to human apprehension, consists of four parts, viz., the obvious past, the specious present, the real present, and the future. Omitting the specious present, it consists of three . . . . nonentities—the past, which does not exist, the future, which does not exist, and their conterminous, the present; the faculty from which it proceeds lies to us in the fiction of the specious present."

In short, the practically cognized present is no knife-edge, but a saddle-back, with a certain breadth of its own on which we sit perched, and from which we look in two directions into time. The unit of composition of our perception of time is a *duration*, with a bow and a stern, as it were—a rearward- and a forward-looking end.[1] It is only as parts of this *duration-block* that the relation of *succession* of one end to the other is perceived. We do not first feel one end and then feel the other after it, and from the perception of the succession infer an interval of time between, but we seem to feel the interval of time as a whole, with its two ends embedded in it. The experience is from the outset a synthetic datum, not a simple one; and to sensible perception its elements are inseparable, although attention looking back may

[1] Locke, in his dim way, derived the sense of duration from reflection on the succession of our ideas ("Essay," Book II, Chap. XIV, § 3; Chap. XV, § 12). Reid justly remarks that if ten successive elements are to make duration, "then one must make duration, otherwise duration must be made up of parts that have no duration, which is impossible. . . . I conclude, therefore, that there must be duration in every single interval or element of which the whole duration is made up. Nothing, indeed, is more certain than that every elementary part of duration must have duration, as every elementary part of extension must have extension. Now, it must be observed that in these elements of duration, or single intervals of successive ideas, there is no succession of ideas, yet we must conceive them to have duration; whence we may conclude with certainty that *there is a conception of duration where there is no succession of ideas in the mind.*" ("Intellectual Powers," Essay III, Chap. V.)

easily decompose the experience, and distinguish its beginning from its end.

When we study the perception of Space, we find it quite analogous to time in this regard.[1] Date in time corresponds to position in space; and although we now mentally construct large spaces by mentally imagining remoter and remoter positions, just as we now construct great durations by mentally prolonging a series of successive dates, yet the original experience of both space and time is always of something already given as a unit, inside of which attention afterward discriminates parts in relation to each other. Without the parts already given as *in* a time and *in* a space, subsequent discrimination of them could hardly do more than perceive them as *different* from each other; it would have no motive for calling the difference time-succession in this instance and spatial position in that.

And just as in certain experiences we may be conscious of an extensive space full of objects, without locating each of them distinctly therein, so when many impressions follow in excessively rapid succession in time, although we may be distinctly aware that they occupy some duration, and are not simultaneous, we may be quite at a loss to tell which comes first and which last; or we may even invert their real order in our judgment. In complicated reaction-time experiments, where signals and motions, and clicks of the apparatus come in exceedingly rapid order, one is at first much perplexed in deciding what the order is, yet of the fact of its occupancy of time we are never in doubt.

We must now proceed to an account of the *facts* of time-perception in detail as preliminary to our speculative conclusion. Many of the facts are matters of patient experimentation, others of common experience.

First of all, we note a marked difference between the elementary sensations of duration and those of space. The former have a much narrower range; the time-sense may be called a myopic organ, in comparison with the eye, for example. The eye sees rods, acres, even miles, at a single glance, and these totals it can afterward subdivide into an almost infinite number of distinctly identi-

[1] Cf. an essay, entitled "The Spatial Quale," in this Journal for Jan., 1879 (vol. xiii, p. 64).

fied parts. The units of duration, on the other hand, which the time-sense is able to take in at a single stroke, are groups of a few seconds, and within these units very few subdivisions—perhaps forty at most, as we shall presently see—can be clearly discerned. The durations we have practically most to deal with—minutes, hours, and days—have to be symbolically conceived, and constructed by mental addition, after the fashion of those extensions of hundreds of miles and upward, which in the field of space are beyond the range of most men's practical interests altogether. To "realize" a quarter of a mile we need only look out of the window and *feel* its length by an act which, though it may in part result from organized associations, yet seems immediately performed. To realize an hour, we must count "now!—now!—now!—now!—" indefinitely. Each "now" is the feeling of a separate *bit* of time, and the exact sum of the bits never makes a very clear impression on our mind.

How many bits can we clearly apprehend at once? Very few if they are long bits, more if they are extremely short, most if they come to us in compound groups, each including smaller bits of its own.

Hearing is the sense by which the subdivision of durations is most sharply made. Almost all the experimental work on the time-sense has been done by means of strokes of sound. How long a series of sounds, then, can we group in the mind so as not to confound it with a longer or a shorter series?

Our spontaneous tendency is to break up any monotonously given series of sounds into some sort of a rhythm. We involuntarily accentuate every second, or third, or fourth beat, or we break the series in still more intricate ways. Whenever we thus grasp the impressions in rhythmic form, we can identify a longer string of them without confusion.

Each variety of verse, for example, has its "law"; and the recurrent stresses and sinkings make us feel with peculiar readiness the lack of a syllable or the presence of one too much. Divers verses may again be bound together in the form of a stanza, and we may then say of another stanza, "Its second verse differs by so much from that of the first stanza," when but for the felt stanza-form the two differing verses would have come to us too separately to be compared at all. But these superposed systems of rhythm

soon reach their limit. In music, as Wundt says,[1] "while the measure may easily contain 12 changes of intensity of sound (as in $\frac{12}{8}$ time), the rhythmical group may embrace 6 measures, and the period consist of 4, exceptionally of 5 (8?) groups."

Wundt and his pupil Dietze have both tried to determine experimentally the *maximal extent of our immediate distinct consciousness for successive impressions.*

Wundt found[2] that 12 impressions could be distinguished clearly as a united cluster, provided they were caught in a certain rhythm by the mind, and succeeded each other at intervals not smaller than 0·3 and not larger than 0·5 of a second. This makes the total time distinctly apprehended to be equal to from 3·6 to 6 seconds.

Dietze[3] gives larger figures. The most favorable intervals for clearly catching the strokes were when they came at from 0·3 second to 0·18 second apart. *Forty* strokes might then be remembered as a whole, and identified without error when repeated, provided the mind grasped them in 5 sub-groups of 8, or in 8 sub-groups of 5 strokes each. When no grouping of the strokes beyond making *couples* of them by the attention was allowed—and practically it was found impossible not to group them in at least this simplest of all ways—16 was the largest number that could be clearly apprehended as a whole.[4] This would make 40 times 0·3 second, or 12 seconds, to be the *maximum filled duration* of which we can be both *distinctly and immediately* aware.

The maximum unfilled, or *vacant duration*, seems to lie within the same objective range. Estel and Mehner, also working in Wundt's laboratory, found it to vary from 5 or 6 to 12 seconds, and perhaps more. The differences seemed due to practice rather than to idiosyncrasy.[5]

[1] "Physiol. Psych.," ii, 54, 55.

[2] "Physiol. Psych.," ii, 213.

[3] "Philosophische Studien," ii, 362.

[4] *Counting* was of course not permitted. It would have given a symbolic concept and no intuitive or immediate perception of the totality of the series. With counting we may of course compare together series of any length—series whose beginnings have faded from our mind, and of whose totality we retain no sensible impression at all. To count a series of clicks is an altogether different thing from merely perceiving them as discontinuous. In the latter case we need only be conscious of the bits of empty duration between them; in the former we must perform rapid acts of association between them and as many names of numbers.

[5] Estel in Wundt's "Philosophische Studien," ii, 50. Mehner, *ibid.*, ii, 571. In

These figures may be roughly taken to stand for the most important part of what, with Mr. Clay, we called, a few pages back, the *specious present.* The specious present has, in addition, a vaguely vanishing backward and forward fringe; but its nucleus is probably the dozen seconds or less that have just elapsed.

If these are the maximum, what, then, is the *minimum* amount of duration which we can distinctly feel?

The smallest figure experimentally ascertained was by Exner, who distinctly heard the doubleness of two successive clicks of a Savart's wheel, and of two successive snaps of an electric spark, when their interval was made as small as about $\frac{1}{500}$ of a second.[1]

With the eye, perception is less delicate. Two sparks, made to fall beside each other in rapid succession on the centre of the retina, ceased to be recognized as successive by Exner when their interval fell below 0″·044.[2]

Where, as here, the succeeding impressions are only 2 in number, we can easiest perceive the interval between them. Prof. G. S. Hall, who experimented with a modified Savart's wheel, which gave clicks in varying number and at varying intervals, says:[3] "In

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Dietze's experiments even numbers of strokes were better caught than odd ones, by the ear. The *rapidity of their sequence* had a great influence on the result. At more than 4 seconds apart it was impossible to perceive series of them as units in all (Cf. Wundt, "Physiol. Psych.," ii, 214). They were simply counted as so many individual strokes. Below 0·21 to 0·11 second, according to the observer, judgment again became confused. It was found that the rate of succession most favorable for grasping long series was when the strokes were sounded at intervals of from 0″·3 to 0″·18 apart. Series of 4, 6, 8, 16 were more easily identified than series of 10, 12, 14, 18. The latter could hardly be clearly grasped at all. Among odd numbers, 3, 5, 7 were the series easiest caught; next, 9, 15; hardest of all, 11 and 13; and 17 was impossible to apprehend.

[1] The exact interval of the sparks was 0″·00205. The doubleness of their snap was usually replaced by a single-seeming sound when it fell to 0″·00198, the sound becoming *louder* when the sparks seemed simultaneous. The *difference* between these two intervals is only $\frac{7}{100000}$ of a second; and, as Exner remarks, our ear and brain must be wonderfully efficient organs to get distinct feelings from so slight an objective difference as this. See Pflüger's Archiv., Bd. XI.

[2] *Ibid.*, p. 407. When the sparks fell so close together that their irradiation circles overlapped, they appeared like *one spark moving* from the position of the first to that of the second; and they might then follow each other as close as 0″·015 without the *direction of the movement* ceasing to be clear. When one spark fell on the centre, the other on the margin, of the retina, the time-interval for successive apprehension had to be raised to 0″·076.

[3] Hall and Jastrow: "Studies of Rhythm," "Mind," vol. xi, p. 58.

order that their discontinuity may be clearly perceived, 4 or even 3 clicks or beats must be farther apart than 2 need to be. When 2 are easily distinguished, 3 or 4 separated by the same interval . . . are often confidently pronounced to be 2 or 3, respectively. It would be well if observations were so directed as to ascertain, at least up to ten or twenty, the increase [of interval] required by each additional click in a series for the sense of discontinuity to remain constant throughout."[1]

Where the first impression falls on one sense, and the second on another, the perception of the intervening time tends to be less certain and delicate, and it makes a difference which impression comes first. Thus, Exner found[2] the smallest perceptible interval to be, in seconds:

From sight to touch	0·071
From touch to sight	0·053
From sight to hearing	0·16
From hearing to sight	0·06
From one ear to another	0·064

To be conscious of a time-interval at all is one thing; to tell whether it be shorter or longer than another interval is a different thing. A number of experimental data are on hand which give us a measure of the delicacy of this latter perception. The problem is that of the *smallest difference* we can perceive *between two times.*

The difference is at its minimum when the times themselves are

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[1] Nevertheless, multitudinous impressions may be felt as discontinuous, though separated by excessively minute intervals of time. Grünhagen says (Pflüger's "Arch.," vi, p. 175) that 10,000 electric shocks a second are felt as interrupted, by the tongue (!). Von Wittich (*ibid.*, ii, 329), that between 1,000 and 2,000 strokes a second are felt as discrete by the finger. W. Preyer, on the other hand ("Die Grenzen des Empfindungsvermögens," etc, 1868, p. 15), makes contacts appear continuous to the finger when 36·8 of them follow in a second. Similarly, Mach ("Wiener Sitzgsb," li, 2, 142) gives about 36. Sulanne ("Comptes. Rendus," lxxxii, p. 1314) found summation of finger contacts after 22 repetitions in a second. Such discrepant figures are of doubtful worth. On the retina 20 to 30 impressions a second at the very utmost can be felt as discrete when they fall on the same spot. The eär, which begins to fuse stimuli together into a musical tone when they follow at the rate of a little over 30 a second, can still feel 132 of them a second as discontinuous when they take the shape of "beats" (Helmholtz, "Tonempfindungen," 3d ed., p. 270).

[2] Pflüger's "Archiv," xi, 428. Also in Hermann's "Hdbh. d. Physiol.," 2 Bd., i Thl., pp. 260–262.

very short. Exner,[1] reacting as rapidly as possible with his foot, upon a signal seen by the eye (spark), noted all the reactions which seemed to him either slow or fast in the making. He thought thus that deviations of about $\frac{1}{100}$ of a second either way from the average were correctly noticed by him at the time. The average was here 0″·1840. Hall and Jastrow listened to the intervals between the clicks of their apparatus. Between two such equal intervals of 4″·27 each, a middle interval was included, which might be made either shorter or longer than the extremes. "After the series had been heard two or even three times, no impression of the relative length of the middle interval would often exist, and only after hearing the fourth and last [repetition of the series] would the judgment incline to the *plus* or *minus* side. Inserting the variable between two invariable and like intervals greatly facilitated judgment, which between two unlike terms is far less accurate."[2] Three observers in these experiments made no error when the middle interval varied $\frac{1}{60}$ from the extremes. When it varied $\frac{1}{120}$, errors occurred, but were few. This would make the minimum *absolute* difference perceived as large as 0″·355.

This minimum absolute difference, of course, increases as the times compared grow long. Attempts have been made to ascertain what *ratio* it bears to the times themselves. According to Fechner's "Psychophysic Law" it ought always to bear the same ratio. Various observers, however, have found this not to be the case.[3] On the contrary, very interesting *oscillations* in the accu-

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[1] Pflüger's "Archiv," vii, 639. Tigerstedt ("Bihang till Kongl. Fvenska Vetenskaps-Akad. Handl.," Bd. 8, Häfte 2, Stockholm, 1884) revises Exner's figures, and shows that his conclusions are exaggerated. According to Tigerstedt, two observers almost always rightly appreciated 0″·05 or 0″·06 of reaction-time difference. Half the time they did it rightly when the difference sank to 0″·03, though from 0″·03 and 0″·06 differences were often not noticed at all. Buccola found ("Le Legge del Tempo nei Fenomeni del Pensiero," Milano, 1883, p. 371) that, after much practice in making rapid reactions upon a signal, he estimated directly, in figures, his own reaction-time, in 10 experiments, with an error of from 0″·010 to 0″·018; in 6, with one of 0″·005 to 0″·009; in one, with one of 0″·002; and in 3, with one of 0″·003.

[2] "Mind," xi, 61 (1886).

[3] Mach, "Wiener Sitzungsb.," li, 2, 133 (1865); Estel, *loc. cit.*, p. 65; Mehner, *loc. cit.*, p. 586; Buccola, *op. cit.*, p. 378. Fechner labors to prove that his law is only overlaid by other interfering laws in the figures recorded by these experimenters; but his case seems to me to be one of desperate infatuation with a hobby. (See Wundt's "Philosophische Studien," iii, 1.)

racy of judgment and in the direction of the error—oscillations dependent upon the absolute amount of the times compared—have been noticed by all who have experimented with the question. Of these a brief account may be given.

In the first place, in every list of intervals experimented with there will be found what Vierordt calls an "indifference-point," that is to say, an interval which we judge with maximum accuracy, a time which we tend to estimate as neither longer nor shorter than it really is, and away from which, in both directions, errors increase their size.[1] This time varies from one observer to another, but its average is remarkably constant, as the following table shows.[2]

The times, noted by the ear, and the average indifference-points (given in seconds) were, for—

Wundt [3]	0·72
Kollert [4]	0·75
Estel (probably)	0·75
Mehner	0·71
Stevens [5]	0·71
Mach [6]	0·35
Buccola (about) [7]	0·40

[1] Curious discrepancies exist between the German and American observers with respect to the *direction* of the error below and above the point of indifference—differences perhaps due to the *fatigue* involved in the American method. The Germans all lengthened intervals below it and shortened those above. With 7 Americans experimented on by Stevens this was exactly reversed. The German method was to passively listen to the intervals, then judge; the American was to reproduce them actively by movements of the hand. In Mehner's experiments there was found a second indifference-point at about 5 seconds, beyond which times were judged again too long.

[2] With Vierordt and his pupils the indifference-point lay as high as from 1·5 sec. to 4·9 sec., according to the observer (Cf. "Der Zeitsinn," 1868, p. 112). In most of these experiments the time heard was actively reproduced, after a short pause, by movements of the hand, which were recorded. Wundt gives good reasons ("Physiol. Psych.," ii, 289, 290) for rejecting Vierordt's figures as erroneous. Vierordt's book, it should be said, is full of important matter, nevertheless.

[3] "Physiol. Psych.," ii, 286, 290.

[4] "Philosophische Studien," i, 86.

[5] "Mind," xi, 400.

[6] *Loc. cit.*, p. 144.

[7] *Op. cit.*, p. 376. Mach's and Buccola's figures, it will be observed, are about *one half* of the rest—sub-multiples, therefore. It ought to be observed, however, that Buccola's figure has little value, his observations not being well fitted to show this particular point.

The remarkable thing about these figures is the recurrence they show in so many men of about three fourths of a second, as the interval of time most easy to catch and reproduce. More remarkable still, both Estel and Mehner found that *multiples* of this time were more accurately reproduced than the time-intervals of intermediary length.[1] There would seem thus to exist something like a periodic or rhythmic sharpening of our time-sense. What can the explanation of such a phenomenon be? We can better turn to this question after going through the rest of our facts.

Our sense of time, like other senses, seems subject to the law of *contrast*. It appeared pretty plainly in Estel's observations that an interval sounded shorter if a long one had immediately preceded it, and longer when the opposite was the case.

Like other senses, too, our sense of time is sharpened by *practice*. Mehner, in the interesting paper we have quoted, ascribes almost all the discrepancies between other observers and himself to this cause alone.[2]

Tracts of time *filled* (with clicks of sound) seem longer than vacant ones of the same duration, when the latter does not exceed a second or two.[3] This, which reminds one of what happens with spaces seen by the eye, becomes reversed when longer times are taken. It is, perhaps, in accordance with this law that a *loud* sound, limiting a short interval of time, makes it appear longer, a *slight* sound shorter. In comparing intervals marked out by sounds, we must take care to keep the sounds uniform.[4]

There is a certain emotional *feeling* accompanying the intervals of time, as is well known in music. The sense of haste goes with one measure of rapidity, that of delay with another; and these two feelings harmonize with different mental moods. Vierordt listened to series of strokes performed by a metronome at rates varying from 40 to 200 a minute, and found that they very naturally fell into seven categories, from "very slow" to "very

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[1] Estel's figures led him to think that *all* the multiples enjoyed this privilege; with Mehner, on the other hand, only the *odd* multiples showed diminution of the average error; thus, 0·71, 2·15, 3·55, 5, 6·4, 7·8, 9·3, and 10·65 seconds were respectively registered with the least error. Cf. "Phil. Studien," ii, pp. 57, 562–565.

[2] Cf. especially pp. 558–561.

[3] Wundt, "Physiol. Psych.," ii, 287. Hall and Jastrow, "Mind," xi, 62.

[4] Mehner, *loc. cit.*, p. 553.

fast."[1] Each category of feeling included the intervals following each other within a certain range of speed, and no others. This is a qualitative, not a quantitative judgment—an æsthetic judgment, in fact. The middle category, of speed that was neutral, or, as he calls it, "adequate," contained intervals that were grouped about 0·62 second, and Vierordt says that this made what one might almost call an *agreeable* time.[2]

The feeling of time and accent in music, of rhythm, is quite independent of that of melody. Tunes with marked rhythm can be readily recognized when simply drummed on the table with the finger-tips.

Although subdividing the time by beats of sensation aids our accurate knowledge of the amount of it that elapses, such subdivision does not seem at the first glance essential to our perception of its flow. Let one sit with closed eyes and, abstracting entirely from the outer world, attend exclusively to the passage of time, like one who wakes, as the poet says, "to hear the time flowing in the middle of the night, and all things moving to a day of doom." There seems under such circumstances as these no variety in the material content of our thought, and what we notice appears, if anything, to be the pure series of durations budding, as it were, and growing beneath our indrawn gaze. Is this really so or not? The question is important, for, if the experience be what it roughly seems, we have a sort of special sense for pure time—a sense to which empty duration is an adequate stimulus; while if it be an illusion, it must be that our perception of time's flight, in the experiences quoted, is due to the *filling* of the time, and to our *memory* of a content which it had a moment previous, and which we feel to agree or disagree with its content now.

It takes but a small exertion of introspection to show that the latter alternative is the true one, and that we can no more intuit a duration than we can intuit an extension, devoid of *all* sensible content. Just as with closed eyes we perceive a dark visual field in which a curdling play of obscurest luminosity is always going

[1] The number of distinguishable *differences* of speed between these limits is, as he takes care to remark, very much larger than 7. "Der Zeitsinn," p. 137.

[2] P. 19, §·18, p. 112.

on; so, be we never so abstracted from distinct outward impressions, we are always inwardly immersed in what Wundt has somewhere called the twilight of our general consciousness. Our heart-beats, our breathing, the pulses of our attention, fragments of words or sentences that pass through our imagination, are what people this dim habitat. Now, all these processes are rhythmical, and are apprehended by us, as they occur, in their totality; the breathing and pulses of attention, as coherent successions, each with its rise and fall; the heart-beats similarly, only relatively far more brief; the words not separately, but in connected groups. In short, empty our minds as we may, some form of *changing process* remains for us to feel, and cannot be expelled. And along with the sense of the process and its rhythm, goes the sense of the length of time it lasts. Awareness of *change* is thus the condition on which our perception of time's flow depends; but there exists no reason to suppose that empty time's own changes are sufficient for the awareness of change to be aroused. The change must be of some concrete sort—an outward or inward sensible series, or a process of attention or volition.

And here again we have an analogy with space. The earliest form of distinct space-perception is undoubtedly that of a movement over some one of our sensitive surfaces, and this movement is originally given as a simple whole of feeling, and is only decomposed into its elements—successive positions successively occupied by the moving body—when our education in discrimination is much advanced. But a movement is a change, a process; so we see that in the time-world and the space-world alike the first known things are not elements, but combinations, not separate units, but wholes already formed. The condition of *being* of the wholes may be the elements; but the condition of our *knowing* the elements is our having already felt the wholes as wholes.

In the experience of watching empty time flow—"empty" to be taken hereafter in the relative sense just set forth—we tell it off in pulses. We say "now! now! now!" or we count "more! more! more!" as we feel it bud. This composition out of units of duration is called the law of time's *discrete flow*. The discreteness is, however, merely due to the fact that our successive acts of *recognition* or *apperception* of *what* it is are discrete. The sensation is as continuous as any sensation can be. All continuous sen-

sations are *named* in beats. We notice that a certain finite "more" of them is passing or already past. To adopt Hodgson's image, the sensation is the measuring tape, the perception the dividing-engine which stamps its length. As we listen to a steady sound, we *take it in* in discrete pulses of recognition, calling it successively "the same! the same! the same!" The case stands no otherwise with time.

After a small number of beats, our impression of the amount we have told off becomes quite vague. Our only way of knowing it accurately is by counting, or noticing the clock, or through some other symbolic conception.[1] When the times exceed hours, or days, the conception is absolutely symbolic. We think of the amount we mean either solely as a *name*, or by running over a few salient *dates* therein, with no pretence of imagining the full durations that lie between them. No one has anything like a *perception* of the greater length of the time between now and the first century than of that between now and the tenth. To an historian, it is true, the later interval will suggest a host of additional dates and events, and so appear a more *multitudinous* thing. And for the same reason most people will think they directly perceive the length of the past fortnight to exceed that of the past week. But there is properly no comparative time *intuition* in these cases at all. It is but dates and events, *representing* time; their abundance *symbolizing* its length. I am sure that this is so, even where the times compared are no more than an hour or so in length. It is the same with Spaces of many miles, which we always compare with each other by the numbers which measure them.[2]

[1] "Any one wishing yet further examples of this mental substitution will find one on observing how habitually he thinks of the spaces on the clock-face instead of the periods they stand for; how, on discovering it to be half an hour later than he supposed, he does not represent the half hour in its duration, but scarcely passes beyond the sign of it marked by the finger." (H. Spencer: "Psychology," § 336.)

[2] The only objections to this which I can think of are: (1) The accuracy with which some men judge of the hour of day or night without looking at the clock; (2) the faculty some have of waking at a preappointed hour; (3) the accuracy of time-perception reported to exist in certain trance-subjects. It might seem that in these persons some sort of a subconscious record was kept of the lapse of time *per se*. But this cannot be admitted until it is proved that there are no physiological processes, the feeling of whose course may serve as a *sign* of how much time has sped, and so lead us to infer the hour. That there are such processes it is hardly possible to doubt. An ingenious friend of mine was long puzzled to know why each day of the week had such a charac-

From this we pass naturally to speak of certain familiar variations in our estimation of lengths of time. In general, a time filled with varied and interesting experiences, objects which rivet attention, vivid feelings, etc., seems short in passing, but long as we look back. On the other hand, a tract of time empty of experiences, seems long in passing, but in retrospect short. A week of travel and sight-seeing may subtend an angle more like three weeks in the memory; and a month of sickness hardly yields more memories than a day. The length in retrospect depends obviously on the multitudinousness of the memories which the time affords. Many objects, events, changes, many subdivisions, immediately widen the view as we look back. Emptiness, monotony, familiarity, make it shrivel up. In Von Holtei's "Vagabonds" one Anton is described as revisiting his native village. "Seven years," he exclaims, "seven years since I ran away! More like seventy it seems, so much has happened. I cannot think of it all without becoming dizzy—at any rate not now. And yet again, when I look at the village, at the church-tower, it seems as if I could hardly have been seven days away."

Prof. Lazarus[1] thus explains both of these contrasted illusions by our principle of the awakened memories being multitudinous or few. "The circle of experiences, widely extended, rich in variety, which he had in view on the day of his leaving the village rises now in his mind as its image lies before him. And with it—in rapid succession and violent motion, not in chronologic order, or from chronologic motives, but suggesting each other by all sorts of connections—arise massive images of all his rich vagabondage and roving life. They roll and wave confusedly together, first perhaps one from the first year, then from the sixth, soon from the second, again from the fifth, the first, etc., until it seems as if

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teristic physiognomy to him. That of Sunday was soon noticed to be due to the cessation of the city's rumbling, and the sound of people's feet shuffling on the sidewalk; of Monday, to come from the clothes drying in the yard and casting a white reflection on the ceiling; of Tuesday, to a cause which I forget; and I think my friend did not get beyond Wednesday. Probably each hour in the day has for most of us some outer or inner sign associated with it as closely as these signs with the days of the week. It must be admitted, after all, however, that the great improvement of the time-perception during sleep and trance is a mystery not as yet cleared up. Idiots, too, are said sometimes to possess this faculty in a marked degree.

[1] "Ideale Fragen," 1878, p. 219 (Essay, "Zeit und Weile").

seventy years must have been there, and he reels with the fulness of his vision. . . . Then the inner eye turns away from all this past. The outer one turns to the village, especially to the church-tower. The sight of it calls back the old sight of it, so that the consciousness is filled with that alone, or almost alone. The one vision compares itself with the other, and looks so near, so unchanged, that it seems as if only a week of time could have come between."

The same space of time seems shorter as we grow older—that is, the days, the months, and the years do so; whether the hours do so is doubtful, and the minutes and seconds to all appearance remain about the same. "Whoever counts many lustra in his memory need only question himself to find that the last of these, the past five years, have sped much more quickly than the preceding periods of equal amount. Let any one remember his last eight or ten school years: it is the space of a century. Compare with them the last eight or ten years of life: it is the space of an hour." So writes Prof. Janet,[1] and gives a solution which can hardly be said to diminish the mystery. There is a law, he says, by which the apparent length of a time-interval at a given epoch of a man's life is proportional to the total length of the life itself. A child of 10 feels a year as $\frac{1}{10}$ of his whole life—a man of 50 as $\frac{1}{50}$, the whole life meanwhile apparently preserving a constant length. This formula roughly expresses the phenomena, it is true, but cannot possibly be an elementary psychic law; and it is certain that, in great part at least, the foreshortening of the years as we grow older is due to the monotony of memory's content, and the consequent simplification of the backward-glancing view. In youth we may have an absolutely new experience, subjective or objective, every hour of the day. Apprehension is vivid, retentiveness strong, and our recollections of that time, like those of a time spent in rapid and interesting travel, are of something intricate, multitudinous and long-drawn out. But as each passing year converts some of this experience into automatic routine which we hardly note at all, the days and the weeks smooth themselves out in recollection to mere contentless units, and the years grow hollow and collapse.

[1] "Revue Philosophique," vol. iii, p. 496.

So much for the apparent shortening of tracts of time in *retrospect*. They shorten *in passing* whenever we are so fully occupied with their content as not to note the actual time itself. A day full of excitement, with no pause, is said to pass "ere we know it." On the contrary, a day full of waiting, of unsatisfied desire for change, will seem a small eternity. *Tædium*, *ennui*, *Langweile*, *boredom*, are words for which, probably, every language known to man has its equivalent. It comes about whenever, from the relative emptiness of content of a tract of time, we grow attentive to the passage of the time itself. Expecting, and being ready for, a new impression to succeed; when it fails to come, we get an empty time instead of it; and such experiences, ceaselessly renewed, make us most formidably aware of the extent of the mere time itself.[1] Close your eyes and simply wait to hear somebody tell you that a minute has elapsed. The full length of your leisure with it seems incredible. You engulf yourself into its bowels as into those of that interminable first week of an ocean voyage, and find yourself wondering that history can have overcome many such periods in its course. All because you attend so closely to the mere feeling of the time *per se*, and because your attention to that is susceptible of such fine-grained successive subdivision. The *odiousness* of the whole experience comes from its insipidity; for *stimulation* is the indispensable requisite for pleasure in an experience, and the feeling of bare time is the least stimulating experience we can have.[2]

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[1] "Empty time is most strongly perceived when it comes as a *pause* in music or in speech. Suppose a preacher in the pulpit, a professor at his desk, to stick still in the midst of his discourse; or let a composer (as is sometimes purposely done) make all his instruments stop at once; we await every instant the resumption of the performance, and, in this awaiting, perceive, more than in any other possible way, the empty time. To change the example, let, in a piece of polyphonic music—a figure, for instance, in which a tangle of melodies are under way—suddenly a single voice be heard, which sustains a long note, while all else is hushed. . . . This one note will appear very protracted—why? Because we *expect* to hear accompanying it the notes of the other instruments, but they fail to come." (Herbart: "Psychol. als W.," § 115.)

[2] A night of pain will seem terribly long; we keep looking forward to a moment which never comes—the moment when it shall cease. But the odiousness of this experience is not named *ennui* or *Langweile*, like the odiousness of time that seems long from its emptiness. The more positive odiousness of the pain, rather, is what tinges our memory of the night. What we feel, as Prof. Lazarus says (*op. cit.*, p. 202), is the long time of the suffering, not the suffering of the long time *per se*.

The sensation of tædium is a *protest*, says Volkmann, against the entire present.

Exactly parallel variations occur in our consciousness of space. A road we walk back over, hoping to find at each step an object we have dropped, seems to us longer than when we walked over it the other way. A space we measure by pacing appears longer than one we traverse with no thought of its length. And in general an amount of space attended to in itself leaves with us more impression of spaciousness than one of which we only note the content.[1]

I do not say that *everything* in these fluctuations of estimate can be accounted for by the time's content being crowded and interesting, or simple and tame. Both in the shortening of time by old age and in its lengthening by *ennui*, some deeper cause *may* be at work. This cause can only be ascertained, if it exist, by finding out *why we perceive time at all.* To this inquiry let us, though without much hope, proceed.

If asked why we perceive the light of the sun, or the sound of an explosion, we reply, "Because certain outer forces, ether-waves or air-waves, smite upon the brain, awakening therein changes, to which the conscious perceptions, light and sound, respond." But we hasten to add that neither light nor sound *copy* or *mirror* the ether- or air-waves; they represent them only symboli cally. The *only* case, says Helmholtz, in which such copying occurs, and in which "our perceptions can truly correspond with outer reality, is that of the *time-succession* of phenomena. Simultaneity, succession, and the regular return of simultaneity or succession, can obtain as well in sensations as in outer events. Events, like our perceptions of them, take place in time, so that the time-relations of the latter can furnish a true copy of those of the former. The sensation of the thunder follows the sensation

[1] On these variations of time-estimate, Cf. Romanes, "Consciousness of Time," in "Mind," vol. iii, p. 297; J. Sully, "Illusions," pp. 245–261, 302–305; W. Wundt, "Physiol. Psych.," ii, 287, 288; besides the essays quoted from Lazarus and Janet. In German, the successors of Herbart have treated of this subject: compare Volkmann's "Lehrbuch d. Psych.," § 89, and for references to other authors his note 3 to this section. Lindner ("Lbh. d. empir. Psych."), as a parallel effect, instances Alexander the Great's life (thirty-three years), which seems to us as if it must be long, because it was so eventful. Similarly the English Commonwealth, etc.

of the lightning just as the sonorous convulsing of the air by the electric discharge reaches the observer's place later than that of the luminiferous ether.[1]

One experiences an almost instinctive impulse, in pursuing such reflections as these, to follow them to a sort of crude speculative conclusion, and to think that he has at last got the mystery of cognition where, to use a vulgar phrase, "the wool is short." What more natural, we say, than that the sequences and durations of things should become known? The succession of the outer forces stamps itself as a like succession upon the brain. The brain's successive changes are copied exactly by correspondingly successive pulses of the mental stream. The mental stream, feeling itself, must feel the time-relations of its own states. But as these are copies of the outward time-relations, so must it know them too. That is to say, these latter time-relations are the stimulus arousing their own cognition; or, in other words, the mere existence of time in those changes out of the mind which affect the mind is a sufficient cause why time is perceived by the mind.

This philosophy is unfortunately too crude. Even though we *were* to conceive the outer successions as forces stamping their image on the brain, and the brain's successions as forces stamping their image on the mind,[2] still, between the mind's own changes *being* successive, and *knowing their own succession*, lies as broad a chasm as between the object and subject of any case of cognition in the world. A succession of feelings, in and of itself, *is* not a feeling of succession. And since, to our successive feelings, a feeling of their own succession is added, that must be treated as an additional fact requiring its own special elucidation, which this talk about outer time-relations stamping copies of themselves within, leaves all untouched.

I have shown, at the outset of the article, that what is past, to be known as past, must be known *with* what is present, and *during* the "present" spot of time. As the clear understanding of this point has some importance, let me, at the risk of repetition,

[1] "Physiol. Optik," p. 445.

[2] Succession, time *per se*, *is* no force. Our talk about its devouring tooth, etc., is all elliptical. Its *contents* are what devour. The law of inertia is incompatible with time's being assumed as an efficient cause of anything.

recur to it again. Volkmann has expressed the matter admirably, as follows:

"One might be tempted to answer the question of the origin of the time-idea by simply pointing to the train of ideas, whose various members, starting from the first, successively attain to full clearness. But against this it must be objected that the successive ideas are not yet the idea of succession, because succession *in* thought is not the thought *of* succession. If idea A follows idea B, consciousness simply exchanges one for another. That B *comes after* A is for our consciousness a non-existent fact; for this *after* is given neither in B nor in A; and no third idea has been supposed. The thinking of the sequence of B upon A is another kind of thinking from that which brought forth A and then brought forth B; and this first kind of thinking is absent so long as merely the thinking of A and the thinking of B are there. In short, when we look at the matter sharply, we come to this antithesis, that if A and B are to be represented *as occurring in succession* they must be *simultaneously represented;* if we are to think *of* them as one after the other, we must *think them* both at once."[1]

If we represent the actual time-stream of our thinking by an horizontal line, the thought *of* the stream or of any segment of its length, past, present, or to come, might be figured in a perpendicular raised upon the horizontal at a certain point. The length of this perpendicular stands for a certain object or content, which in this case is the time thought of,[2] and which is all thought of together at the actual moment of the stream upon which the perpendicular is raised. Mr. James Ward puts the matter very well in his masterly article "Psychology," in the 9th edition of the "Encyclopædia Britannica," page 64. He says:

"We may, if we represent succession as a line, represent simultaneity as a second line at right angles to the first; empty time—

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[1] "Lehrbuch d. Psych.," § 87. Compare also H. Lotze, "Metaphysik," § 154.

[2] As this object has parts, we ought, in order to symbolize the facts thoroughly, to schematize the stream as a body of three dimensions. The time-thought-of would be represented by a section across this stream's length; the portion of the object most distinct in consciousness (the "nucleus of the thought") would be figured by the highest part of the section, on either side of which the section would fall away to symbolize the parts of the object present to consciousness in a vague or "nascent" way.

or time-length without time-breadth, we may say—is a mere abstraction. Now, it is with the former line that we have to do in treating of time as it is, and with the latter in treating of our intuition of time, where, just as in a perspective representation of distance we are confined to lines in a plane at right angles to the actual line of depth. In a succession of events, say of sense-impressions, A B C D E . . . the presence of B means the absence of A and C, but the presentation of this succession involves the simultaneous presence in some mode or other of two or more of the presentations A B C D. In reality, past, present, and future are differences in time, but in presentation all that corresponds to these differences is in consciousness simultaneously."

There is thus a sort of *perspective projection* of past upon present consciousness, similar to that of a wide landscape upon a camera-screen.

And since we saw a while ago that our maximum distinct *intuition* of duration hardly covers more than a dozen seconds (while our maximum vague intuition is probably not more than that of a minute or so), we must suppose that *this amount of duration is pictured pretty steadily in each passing instant of consciousness* by virtue of some pretty constant element of the brain-process to which the consciousness is tied. *This element of the brain-process, whatever it be, must be the cause of our perceiving the fact of time at all.*[1] The duration thus steadily perceived is hardly more than the "specious present," as it was called a few pages back. Its *content* is in a constant flux, events dawning into its forward end as fast as they fade out of its rearward one, and each of them changing its time coefficient from "not yet," or "not quite yet," to "just gone" or "gone," as it passes by. Meanwhile, the specious present, the intuited duration, stands permanent, like the rainbow on the waterfall, with its own quality unchanged by the events that stream through it. Each of these, as it slips out, retains the power of being reproduced; and when reproduced, is reproduced with the duration and neighbors which it originally had. Please observe, however, that the reproduction of an event, after it has dropped out of the immediately intuited past (or rearward and of the specious present) is an entirely

[1] The cause of the perceiving as distinguished from the object perceived.

different psychic fact from its lingering in the specious present. A creature might be entirely devoid of reproductive memory, and yet have the time-sense. It would be limited, in his case, to the duration of the few seconds immediately passing by. I assume reproduction in the text, because I am speaking of human beings who notoriously possess it. Thus memory gets strewn with *dated* things—dated in the sense of being before or after each other.[1] The date of a thing is a mere relation of *before* or *after* the present, or some other thing. Some things we date simply by mentally tossing them into the past or future *direction*. So in space we think of England as simply to the eastward, of Charleston as lying south. But, again, we may date an event exactly by fitting it between two terms of a past or future series explicitly conceived, just as we may accurately think of England or Charleston being just so many miles away.[2]

The things and events thus vaguely or exactly dated become thenceforward those signs and symbols of longer time-spaces, of which we previously spoke. According as we think of a multitude of them, or of few, so we imagine the time they represent to be long or short. But the original paragon and prototype of all conceived times is the specious present, the short duration of which we are immediately and incessantly sensible.

Now, to what element in the brain process may this sensibility be due? It cannot, as we have seen, be due to the mere duration itself of the process; it must be due to an element present at

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[1] "'No more' and 'not yet' are the proper time-feelings, and we are aware of time in no other way than through these feelings," says Volkmann ("Psychol.," § 87). This, which is not strictly true of our feeling of *time per se*, is true of our feeling of *date* in its events.

[2] We construct the miles just as we construct the years. Travelling in the cars makes a succession of different fields of view pass before our eyes. When those that have passed from present sight revive in memory, they maintain their mutual order because their contents overlap. We think them as having been before or behind each other; and, from the multitude of the views we can recall behind the one now presented, we compute the total space we have passed through.

It is often said that the perception of time develops later than that of space, because children have so vague an idea of all dates before yesterday and after to-morrow. But no vaguer than they have of extensions that exceed as greatly their unit of space-intuition. Recently I heard my child of four tell a visitor that he had been "as much as one week" in the country. As he had been there three months, the visitor expressed sur-

every moment of the process, and this element must bear the same inscrutable *sort* of relation to its product which all other elements of neural activity bear to their psychic products, be the latter sensible qualities, or logical relations, or spaces intuited, or pleasures and pains. Several suggestions have been made as to what the element is in the case of time. Treating of them in a note,[1]

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prise, whereupon the child corrected himself by saying he had been there "twelve years." But the child made exactly the same kind of mistake when he asked if Boston was not one hundred miles from Cambridge, the distance being three miles.

[1] Most of these explanations simply give the *signs* which, adhering to impressions, lead us to *date* them within a duration, or, in other words, to assign to them their order. Why it should be a *time*-order, however, is not explained. Herbart's would-be explanation is a simple description of time-perception. He says it comes when, with the last member of a series present to our consciousness, we also think of the first; and then the whole series revives in our thought at once, but with strength diminishing in the *backward* direction ("Psychol. als Wiss.," § 115; "Lehrb. zur Psychol.," §§ 171, 172, 175). Similarly Drobisch, who adds that the series must appear as one already *elapsed* (*durchlaufene*), a word which shows even more clearly the question-begging nature of this sort of account ("Empirische Psychol.," § 59). Th. Waitz is guilty of similar question-begging when he explains our time-consciousness to be engendered by a set of unsuccessful attempts to make our percepts agree with our *expectations* ("Lehrb. d. Psychol.," § 52). Volkmann's mythological account of past representations striving to drive present ones out of the seat of consciousness, being driven *back* by them, etc., suffers from the same fallacy ("Psychol.," § 87). But all such accounts agree in implying one fact—viz., that the brain processes of various events must be active simultaneously and, in varying strength for a time-perception to be possible. Later authors have made this idea more precise. Thus, Lipps: "Sensations arise, occupy consciousness, fade into images, and vanish. According as two of them, *a* and *b*, go through this process simultaneously, or as one precedes or follows the other, the *phases of their fading* will agree or differ; and the difference will be proportional to the time-difference between their several moments of beginning. Thus there are differences of *quality* in the images which the mind may *translate* into corresponding differences of their temporal order. There is no other possible middle term between the objective time-relations and those in the mind than these differences of phase" ("Grundtatsachen des Seelenlebens," p. 588). Lipps accordingly calls them "temporal signs," and hastens explicitly to add that the soul's translation of their order of strength into a time-order is entirely inexplicable (p. 591). M. Guyau's account ("Revue philosophique," xix, 353) hardly differs from that of his predecessors, except in picturesqueness of style. Every change leaves a series of *traînées lumineuses* in the mind like the passage of shooting stars. Each image is in a more fading phase, according as its original was more remote. This group of images gives duration, the mere time-form, the "bed" of time. The distinction of past, present, and future within the bed comes from our active nature. The future (as with Waitz) is what I want, but have not yet got, and must wait for. All this is doubtless true, but is no *explanation*.

Mr. Ward gives, in his "Encyclopædia Britannica" article ("Psychology," p. 65, col. 1), a still more refined attempt to specify the "temporal sign." The problem being,

I will try to express briefly the only conclusion which seems to emerge from a study of them and of the facts—unripe though that conclusion be.

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among a number of things thought as successive, but simultaneously thought, to determine which is first and which last, he says: "After each distinct representation, *a b c d*, there may intervene the representation of that *movement of attention* of which we are aware in passing from one object to another. In our present reminiscences we have, it must be allowed, little direct proof of this intervention; though there is, I think, indirect evidence of it in the tendency of the flow of ideas to follow the order in which the presentations were at first attended to. With the movement itself when the direction of attention changes, we are familiar enough, though the residua of such movements are not ordinarily conspicuous. These residua, then, are our temporal signs. . . . But temporal signs alone will not furnish all the pictorial exactness of the time-perspective. These give us only a fixed series; but the law of obliviscence, by insuring a progressive variation in intensity as we pass from one member of the series to the other, yields the effect which we call time-distance. By themselves such variations in intensity would leave us liable to confound more vivid representations in the distance with fainter ones nearer the present, but from this mistake the temporal signs save us; where the memory-continuum is imperfect such mistakes continually occur. On the other hand, where these variations are slight and imperceptible, though the memory-continuum preserves the order of events intact, we have still no such distinct appreciation of comparative distance in time as we have nearer to the present, where these perspective effects are considerable. . . . Locke speaks of our ideas succeeding each other 'at certain distances not much unlike the images in the inside of a lantern turned round by the heat of a candle,' and 'guesses' that 'this appearance of theirs in train varies not very much in a waking man.' *Now what is this 'distance' that separates a from b, b from c, and so on;* and what means have we of knowing that it is tolerably constant in waking life? *It is, probably, that, the residuum of which I have called a temporal sign; or, in other words, it is the movement of attention from a to b.*" Nevertheless, Mr. Ward does not call our feeling of this movement of attention the *original* of our feeling of time, or its brain-process the brain-process which directly causes us to perceive time. He says, a moment later, that "though the fixation of attention does of course really occupy time, it is probably not in the first instance perceived as time—*i. e.*, as continuous 'protensity,' to use a term of Hamilton's—but as intensity. Thus, if this supposition be true, there is an element in our concrete time-perceptions which has no place in our abstract conception of Time. In Time physically conceived there is no trace of intensity; in time psychically experienced, duration is primarily an intensive magnitude, and so far literally a perception." Its "original" is, then, if I understand Mr. Ward, something like a *feeling* which accompanies, as pleasure and pain may accompany, the movements of attention. Its brain-process must, it would seem, be assimilated in general type to the brain-processes of pleasure and pain. Such would seem more or less consciously to be Mr. Ward's own view, for he says: "Everybody knows what it is to be distracted by a rapid succession of varied impressions, and equally what it is to be wearied by the slow and monotonous recurrence of the same impressions. Now these 'feelings' of distraction and tedium owe their characteristic qualities to movements of attention. In the first, attention is kept incessantly on the move; before it is accommodated to *a*, it is disturbed by the suddenness, intensity, and novelty of *b*; in the second, it is kept all but

The phenomena of "summation of stimuli" in the nervous system prove that each stimulus leaves some latent activity behind it which only gradually passes away. Psychological proof

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stationary by the repeated presentation of the same impression. Such excess and defect of surprises make one realize a fact which in ordinary life is so obscure as to escape notice. But recent experiments have set this fact in a more striking light, and made clear what Locke had dimly before his mind in talking of a certain distance between the presentations of a waking man. In estimating very short periods of time of a second or less, indicated, say, by the beats of a metronome, it is found that there is a certain period for which the mean of a number of estimates is correct, while shorter periods are on the whole over-, and longer periods under-estimated. I take this to be evidence of the time occupied in accommodating or fixing attention." Alluding to the fact that a series of experiences, *a b c d e*, may seem short in retrospect, which seemed everlasting in passing, he says: "What tells in retrospect is the series *a b c d e*, etc.; what tells in the present is the intervening t_1 t_2 t_3, etc., or rather the original accommodation of which these temporal signs are the residuum." And he concludes thus: "We seem to have proof that our perception of duration rests ultimately upon quasi-motor objects of varying intensity, the duration of which we do not directly experience as duration at all."

Wundt also thinks that the interval of about three fourths of a second, which is estimated with the minimum of error, points to a connection between the time-feeling and the succession of distinctly "apperceived" objects before the mind. The "association time" is also equal to about three fourths of a second. This association time he regards as a sort of internal standard of duration to which we involuntarily assimilate all intervals which we try to reproduce, bringing shorter ones up to it and longer ones down. [In the Stevens results we should have to say *contrast* instead of assimilate, for the longer intervals there seem longer, and the shorter ones shorter still.] "Singularly enough," he adds ("Physiol. Psych.," ii, 286), "this time is about that in which in rapid walking, according to the Webers, our legs perform their swing. It seems thus not unlikely that both psychical constants, that of the average speed of reproduction and that of the surest estimation of time, have formed themselves under the influence of those most habitual movements of the body which we also use when we try to subdivide rhythmically longer tracts of time."

Finally, Prof. Mach makes a suggestion more specific still. After saying very rightly that we have a real *sensation* of time—how otherwise should we identify two entirely different airs as being played in the same "time"? how distinguish in memory the first stroke of the clock from the second, unless to each there clove its special time-sensation, which revived with it?—he says "it is probable that this feeling is connected with that organic *consumption* which is necessarily linked with the production of consciousness, and that the time which we feel is probably due to the [mechanical?] *work of* [the process of?] *attention*. When attention is strained, time seems long; during easy occupation, short, etc. . . . The fatigue of the organ of consciousness, as long as we wake, continually increases, and the work of attention augments as continually. Those impressions which are conjoined with a *greater amount* of work of attention appear to us as the *later*." The apparent relative displacement of certain simultaneous events and certain anachronisms of dreams are held by Mach to be easily explicable as effects of a splitting of the attention between two objects, one of which consumes most of it ("Beiträge zur Analyse der Empfindungen," p. 103, foll.). Mach's theory seems worthy of being better worked out.

of the same fact is afforded by those "after-images" which we perceive when a sensorial stimulus is gone. We may read off peculiarities in an after-image left by an object on the eye which we failed to note in the original. We may "hark back" and take in the meaning of a sound several seconds after it has ceased. Delay for a minute, however, and the echo itself of the clock or the question is mute; present sensations have banished it beyond recall. With the feeling of the present thing there must at all times mingle the fading echo of all those other things which the previous few seconds have supplied. Or, to state it in neural terms, there is at every moment a cumulation of brain processes overlapping each other, of which the fainter ones are the dying phases of processes which but shortly previous were active in a maximal degree. *The amount of the overlapping determines the feeling of the duration occupied.* What events shall appear to occupy the duration depends on just what processes the overlapping processes are. We know so little of the intimate nature of the brain's activity that even where a sensation monotonously endures, we cannot say that the earlier moments of it do not leave fading processes behind which coexist with those of the present moment. Duration and events together form our intuition of the *specious present with its content.*[1] *Why* such an intuition should result from such a combination of brain-processes, I do not pretend to say. All I aim at is to state the most *elemental* form of the psycho-physical conjunction.

I have assumed that the brain-processes are sensational ones. Processes of active attention (see Mr. Ward's account in the long foot-note), will leave similar fading brain-processes behind. If the

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It is hard to say now whether he, Ward, and Wundt mean at bottom the same thing or not. The theory advanced in my own text, it will be remarked, does not pretend to be an *explanation*, but only an elementary statement of the "law" which makes us aware of time. The Herbartian mythology purports to *explain*.

[1] It would be rash to say definitely just how many seconds long this specious present must needs be, for processes fade "asymptotically," and the distinctly intuited present merges into a penumbra of mere dim *recency* before it turns into the simply recollected and conceived past. Many a thing which we do not distinctly date by intercalating it in a place between two other things will, nevertheless, come to us with this feeling of belonging to a *near* past. This sense of recency is a feeling *sui generis*, and may affect things that happened hours ago. It would seem to show that their brain-processes are still in a state modified by the foregoing excitement, still in a "fading" phase, in spite of the long interval.

mental processes are conceptual, a complication is introduced of which I will in a moment speak. Meanwhile, still speaking of sensational processes, a remark of Wundt's will throw additional light on the account I give. As is known, Wundt and others have proved that every act of perception of a sensorial stimulus takes an appreciable time. When two different stimuli—*e. g.*, a sight and a sound—are given at once or nearly at once, we have difficulty in attending to both, and may wrongly judge their interval, or even invert their order. Now, as the result of his experiments on such stimuli, Wundt lays down this law:[1] that of the three possible determinations we may make of their order—"namely, simultaneity, continuous transition, and discontinuous transition—only the first and last are realized, *never the second.* Invariably, when we fail to perceive the impressions as simultaneous, we notice a shorter or longer empty time between them, *which seems to correspond to the sinking of one of the ideas and to the rise of the other.* . . . For our attention may share itself equally between the two impressions, which will then compose one total percept [and be simultaneously felt]; or it may be so adapted to one event as to cause it to be perceived immediately, and then the second event can be perceived only after a certain time of latency, during which the attention reaches its effective maximum for it and diminishes for the first event. In this case the events are perceived as *two*, and in successive order—that is, as separated by a time-interval in which attention is not sufficiently accommodated to either to bring a distinct perception about. . . . While we are hurrying from one to the other, everything between them vanishes in the twilight of general consciousness."

One might call this the *law of discontinuous succession in time of percepts to which we cannot easily attend at once.* Each percept then requires a separate brain-process; and when one brain-process is at its maximum, the other is perforce in either a waning or a waxing phase. If our theory of the time-feeling be true, empty time *must* then subjectively appear to separate the two percepts, no matter how close together they may objectively be; for, according to that theory, the feeling of a time-duration is the immediate effect of such an overlapping of brain-processes of different phase —wherever and from whatever cause, it may occur.

[1] "Physiol. Psych.," ii, 263.

To pass, now, to conceptual processes: Suppose I think of the Creation, then of the Christian era, then of the battle of Waterloo, all within a few seconds. These matters have their dates far outside the specious present. The processes by which I think them, however, all overlap. What events, then, does the specious present seem to contain? Simply my successive *acts of thinking* these long-past things, not the long-past things themselves. As the instantly present thought may be of a long-past thing, so the just-past thought may be of another long-past thing. When a long-past event is reproduced in memory and conceived with its date, the reproduction and conceiving traverse the specious present. The immediate content of the latter is then all my *direct experiences*, whether subjective or objective. Some of these may be *representative* of other experiences indefinitely remote.

The number of these direct experiences which the specious present and immediately intuited past may embrace, measures the extent of our "primary," as Professor Exner calls it, or, as Professor Richet calls it, of our "elementary" memory.[1] The sensation resultant from the overlapping is that of the duration the experiences seem to fill. As is the number of any larger set of events to that of these experiences, so we suppose is the longer duration to this duration. But of the longer duration we have no direct "realizing sense." The variations in our appreciation of the same amount of real time may possibly be explained by alterations in the rate of fading of the images, producing changes in the complication of superposed processes, to which changes changed states of consciousness may correspond. But however *long we may feel* a space of time to be, the objective amount of it, *directly perceived* at any one moment by us, can never exceed the scope of our "primary memory" at the moment in question.[2]

We have every reason to think that creatures may possibly differ enormously in the amounts of duration which they intuitively feel, and in the fineness of the events that may fill it. Von

[1] Exner in Hermann's "Hdbch. d. Physiol.," Bd. ii, Thl. ii, p. 281. Richet in "Revue philosophique," xxi, p. 568 (Juin, 1886).

[2] I have spoken of *fading* brain-processes alone, but only for simplicity's sake. *Dawning* processes probably play as important a part in giving the feeling of duration to the specious present.

Bær has indulged[1] in some interesting computations of the effect of such differences in changing the aspect of Nature. Suppose we were able, within the length of a second, to note 10,000 events distinctly, instead of barely ten, as now; if our life were then destined to hold the same number of impressions, it might be 1,000 times as short. We should live less than a month, and personally know nothing of the change of seasons. If born in winter, we should believe in summer as we now believe in the heats of the Carboniferous era. The motions of organic beings would be so slow to our senses as to be inferred, not seen. The sun would stand still in the sky, the moon be almost free from change, and so on. But now reverse the hypothesis and suppose a being to get only one 1,000th part of the sensations that we get in a given time, and consequently to live 1,000 times as long. Winters and summers will be to him like quarters of an hour. Mushrooms and the swifter-growing plants will shoot into being so rapidly as to appear instantaneous creations; annual shrubs will rise and fall from the earth like restlessly boiling-water springs; the motions of animals will be as invisible as are to us the movements of bullets and cannon-balls; the sun will scour through the sky like a meteor, leaving a fiery trail behind him, etc. That such imaginary cases (barring the superhuman longevity) may be realized somewhere in the animal kingdom, it would be rash to deny. "A gnat's wings," says Mr. Spencer,[2] "make ten or fifteen thousand strokes a second. Each stroke implies a separate nervous action. Each such nervous action or change in a nervous centre is probably as appreciable by the gnat as is a quick movement of his arm by a man. And if this, or anything like this, is the fact, then the time occupied by a given external change, measured by many movements in the one case, must seem much longer than in the other case, when measured by one movement."

In hashish-intoxication there is a curious increase in the apparent time-perspective. We utter a sentence, and ere the end is reached the beginning seems already to date from indefinitely long ago. We enter a short street, and it is as if we should never get to the end of it. This alteration might conceivably result from an approach to the condition of Von Bær's and Spencer's short-lived

[1] "Reden," St. Petersburg, 1864, vol. i, pp. 255–268.

[2] "Psychology," § 91.

beings. If our discrimination of successions became finer-grained, so that we noted ten stages in a process where previously we only noted one; and if at the same time the processes faded ten times as fast as before; we might have a specious present of the same subjective length as now, giving us the same time-feeling and containing as many distinguishable successive events, but out from the earlier end of it would have dropped nine-tenths of the real events it now contains. They would have fallen into the general reservoir of merely dated memories, reproducible at will. The beginning of our sentences would have to be expressly recalled; each word would appear to pass through consciousness at a tenth of its usual speed. The condition would, in short, be exactly analogous to the enlargement of space by a microscope; fewer real things at once in the immediate field of view, but each of them taking up more than its normal room, and making the excluded ones seem unnaturally far away.

Under other conditions, processes seem to fade rapidly without the compensating increase in the subdivisibility of successions. Here the apparent length of the specious present contracts. Consciousness dwindles to a point, and loses all intuitive sense of the whence and whither of its path. Express acts of memory replace rapid bird's-eye views. In my own case, something like this occurs in extreme fatigue. Long illnesses produce it. Occasionally, it appears to accompany aphasia.[1] It would be vain to seek to im-

[1] "The patient cannot retain the image of an object more than a moment. His memory is as short for sounds, letters, figures, and printed words. If we cover a written or printed word with a sheet of paper in which a little window has been cut, so that only the first letter is visible through the window, he pronounces this letter. If, then, the sheet is moved so as to cover the first letter and make the second one visible, he pronounces the second, but forgets the first, and cannot pronounce the first and second together." And so forth to the end. "If he closes his eyes and draws his finger exploringly over a well-known object like a knife or key, he cannot combine the separate impressions and recognize the object. But if it is put into his hand so that he can simultaneously touch it with several fingers, he names it without difficulty. This patient has thus lost the capacity for grouping successive . . . impressions . . . into a whole and perceiving them as a whole." (Grashey, in "Archiv. für Psychiatrie," Bd. xvi, pp. 672–673.) It is hard to believe that in such a patient the time intuited was not clipped off like the impressions it held, though perhaps not so much of it.

I have myself often noted a curious exaggeration of time-perspective at the moment of falling asleep. A person will be moving or doing something in the room, and a certain stage of his act (whatever it may be) will be my last waking perception. Then a subsequent stage will wake me to a new perception. The two stages of the act will not

agine the exact brain change in any of these cases. But we must admit the possibility that to some extent the variations of time-estimate between youth and age, and excitement and ennui, are due to such causes, more immediate than the one we assigned some time ago.

But whether our feeling of the time which immediately past[1] events have filled be of something long or of something short, it is not what it is *because those events are past*, but *because they have left behind them processes which are present.* To those processes, however caused, the mind would still respond by feeling a specious present, with one part of it just vanishing or vanished into the past. As the Creator is supposed to have made Adam with a navel—sign of a birth which never occurred—so He might instantaneously make a man with a brain in which were processes just like the "fading" ones of an ordinary brain. The first real stimulus after creation would set up a process additional to these. The processes would overlap; and the new-created man would unquestionably have the feeling, at the very primal instant of his life, of having been in existence already some little space of time.

Let me sum up, now, by saying that we are constantly conscious of a certain duration—the specious present—varying in length from a few seconds to probably not more than a minute, and that this duration (with its content perceived as having one part earlier and the other part later) is the original intuition of time. Longer times are conceived by adding, shorter ones by dividing, portions of this vaguely bounded unit, and are habitually thought by us symbolically. Kant's notion of an *intuition* of objective time as an infinite necessary continuum has nothing to support it. The *cause* of the intuition which we really have cannot be the *dura-*

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be more than a few seconds apart; and yet it always seems to me as if, between the earlier and the later one, a long interval has passed away. I account for the phenomenon thus, calling the two stages of the act *a* and *b* respectively: Were I awake, *a* would leave a fading process in my sensorium which would overlap the process of *b* when the latter came, and both would then appear in the same specious present, *a* belonging to its earlier end. But the sudden advent of the brain change called sleep extinguishes *a*'s fading process abruptly. When *b* then comes and wakes me, *a* comes back, it is true, but not as belonging to the specious present. It has to be specially *revoked* in memory. This mode of revocation usually characterizes long-past things—whence the illusion.

[1] Again I omit the future, merely for simplicity's sake.

tion of our brain-processes or our mental changes; for the intuition is realized at every moment of such duration, and must be due to a permanently present cause. This cause—probably the simultaneous presence of brain-processes of different phase—fluctuates; and hence a certain range of variation in the amount of the intuition, and in its subdivisibility, accrues.

WILLIAM JAMES.

HEGEL'S PHILOSOPHY OF RELIGION.

TRANSLATED FROM THE GERMAN BY F. LOUIS SOLDAN.

C. Classification of the Subject.

There can be but one method for all science for the reason that the method is nothing but the idea itself in its self-development or self-explication, and that there is but One Idea.

Since there are three phases of the idea, this discourse on religion and its development must have three parts. The idea of religion will be considered first in its universality, secondly in the phase of particularity, wherein the idea has parts and distinctions, and which is the phase of differentiation, particularization or limitation (Urtheil), of difference and finitude. The third topic is the reunion of the idea within itself, which forms the conclusion, where the idea returns to itself from the phase of determination (in which it was inadequate to itself) and becomes adequate to its form by cancelling its limitations. This is the rhythm of spirit itself, its pulse, eternal life; without this movement it would be death. It is the essence of spirit to have itself for its object, and thence arises its manifestation. But here spirit is as yet in the relation of objectivity, and in this relation it is finite. The third phase is, that spirit becomes an object to itself in such a manner that it is reconciled to and united with itself again in the object, and, by thus being again one with it, it arrives at itself once more, and attains thereby its freedom. For freedom means to be self-contained (*bei sich selbst zu sein*).

This rhythm, which forms the movement of the totality of our science and of the entire development of the idea, is repeated within each of the three phases which have been mentioned above,

because each of these in its determinateness is in itself or potentially the totality. In the last phase totality becomes actual, or exists for itself. The idea therefore appears first in the form of universality, next in that of particularity, and lastly in the form of singularity or individuality. Consequently, the general movement of our science is that the idea appears divided into its elements (in the same way in which the simple unit of a concept or notion becomes divided into subject and object, when by predicating of it one of its qualities we form a judgment of it), and in the conclusion the idea becomes again self-united.[1] Thus there will be in each of the three spheres of this movement a similar development of the phases, with this difference, however, that in the first sphere this development is held together in the category of universality, in the second s phere (that of particuliarty) the phases appear independent, while in the third sphere (that of singularity or individuality) the development arrives at a union (Schluss) which has been mediated through the totality of the determinations or categories.

This classification is therefore [simply a statement of] the spirit's own movement and of its nature and activity, and we are, so to speak, simply the spectators. This classification results with necessity from the movement of the Idea itself; this necessity, however, must prove itself in the course of this development. The classification, therefore, whose parts and co ntent we now proceed to give, is simply historical.

I. *The General Idea of Religion.*

The first is the idea in its universality, upon which follows, in the second place, the determinateness of the idea—that is,

[1] Translator's Note.—This sentence is a paraphrase rather than a translation. The words which Hegel uses here, *Urtheil* and *Schluss*, have in his terminology a peculiar meaning which cannot be given by any equivalent direct expression in English, but of which it seemed desirable to give some idea. At a first glance, the literal translation of the original seems to be: The general movement of our science is, that the idea becomes a judgment and then completes itself in a syllogism. Hegel, however, uses the word *Urtheil* (judgment) in a sense different from that which it ordinarily has, and employs it in the rarer meaning of "original division or partition" (*Ur-Theil*). In the same way *Schluss*, the word used in German for a syllogism, means literally a locking or linking together. Thus Hegel's expression, that the idea in its second phase becomes an *Urtheil* and in its third is completed in the *Schluss*, describes well the movement of the idea through the stages of particularity and reunion.

the idea in its determinate forms. The latter are necessarily connected with the idea, because in a philosophical inquiry the universal (*i. e.*, the general idea) is placed first not merely in order to occupy a place of honor. In unphilosophical books it may happen that the general ideas (for instance, those of Right, of Nature) are made universal determinations and are placed first. They are rather embarrassing when thus employed [because they seem to be of no special use there]. They are [stated but] hardly seriously discussed, since the notion prevails that they do not possess the same importance as the content proper of the book which is treated of in the subsequent chapters. The so-called general idea seems to have no bearing on the remaining content, except that it maps out to some extent the scope of the subject, so that there may be no introduction of foreign matter. The rest of the content (for instance, magnetism, electricity) is looked upon as the real subject, and the idea as a mere form. Where such a view prevails, the idea (for instance, that of Right), which is placed at the head of a treatise, becomes a mere name for a most abstract and contingent content.

In a philosophical discourse the idea forms the beginning as well, but the idea is also the content itself; it is the absolute subject, the substance; it is like a germ from which the whole tree grows. In the germ are contained all the determinations of the tree—its whole nature, its kind of sap, its ramifications—but not in such a manner that through a microscope one could see in the germ miniature twigs and leaves; the content is there spiritually. In the same way the idea contains the whole nature of the subject, and the cognition of the latter is but the development of the idea, or, in other words, the development of what is potentially contained in the idea but has not yet assumed existence and is waiting for explication and unfolding. We therefore begin with the idea of religion.

1. THE PHASE OF UNIVERSALITY.

The first thing in the idea of religion is again the universal. It is the phase of thinking in its universality. We do not think this or that object, but thinking thinks itself. The object is the universal, which, when active, is Thought. Religion, in so far as it is the elevation to truth, has its starting-point in sensuous,

finite objects. Yet, if the continuation were but a constant passing to other finite objects, it would be a faulty process continued *ad infinitum*, mere words by which no conclusion is ever reached. Thinking, on the contrary, should be the elevation from what is limited to what is absolutely universal, and religion exists for thinking and in thinking alone. God is not the highest emotion, but the highest thought; even when he is dragged down to the realm of image-conception, the content of this concept still belongs to the world of thought. The great error of our age is the opinion that thinking is injurious to religion, and that the latter enjoys a securer existence in proportion as the former is relinquished. This mistake arises from a total misapprehension of higher spiritual relationship. Similarly, in regard to the Idea of Right, good-will is often looked upon as if it were something by itself and stood in a certain contrast to intelligence, and it is imagined that the less a person thinks, the more truly good is his will. By no means! Right and morality exist only because I am a thinking being, and because I do not look upon my freedom as upon that of an empirical person, as belonging to me as an individual. Were it other wise, I might try and enslave my neighbor through stratagem or violence, but I refrain because I consider freedom as something existing in and for itself, as a universal.

In asserting that religion contains the phase of thinking in its perfect universality, and that the unlimited universal is the highest and absolute thought, we do not yet make the distinction between subjective and objective thinking. The universal is object and is thinking absolutely, but not yet developed in itself and as yet without further determinations. In it there is an absence and cancellation of all distinctions; in this ether of thought all finitude has disappeared, everything has vanished, and yet everything is therein contained. But this element of universality cannot yet be determined; in this water, in this transparency, nothing has as yet assumed form and shape.

The continuation of this process is, that the universal now determines itself for itself [or, in other words, actualizes itself], and this self-determination constitutes the idea of God. In the sphere of universality the Idea itself is the material in which the determinations occur, and the process appears in divine forms; but this alienation or formation remains only latent in the divine Idea

because the latter is still all substantiality; in its determination of eternity it remains in the depths of universality.

2. THE PHASE OF PARTICULARITY, OR THE SPHERE OF DIFFERENTIATION.

The particularization or differentiation which in the sphere of universality is still latent, constitutes, after it has once made its appearance actually, another or alien existence in contrast with the [former] extreme of universality. This other extreme is consciousness as individuality, and nothing else. It is the subject in its immediateness, with all its needs, conditions, sins, and the whole empirical and temporal character appertaining to that stage.

The relation between the two sides in this determination is found in my own individuality and its religion. I, the thinking being, that which is in a state of elevation, the actively universal, and I, the immediate subject, are one and the same. The relation between these two sides which seem to stand in such a rigid contrast, merely finite consciousness and being on one hand, and the infinite on the other, is established for myself in religion. By thinking I rise to the Absolute, above all finitude, and become infinite consciousness, while I remain at the same time finite self-consciousness in accordance with my entire empirical determination. Both sides as well as their relation exist for myself. Both sides seek and avoid each other. At one time, for instance, I lay stress on my empirical, finite consciousness and contrast myself with infinity, and at another time I exclude myself from myself; I condemn myself and allow the infinite consciousness to have sway. The middle term of the syllogism contains but the determinations of the two extremes. The two sides do not resemble the columns of Hercules, which, while close to each other, stand opposite each other without any contact. I am, and there is within myself and for myself this contradiction and this conciliation. My own being within, since it is infinite, stands in contrast to myself as finite. I find within myself the determination as finite consciousness, and also, in contrast with it, my thinking, which has the determination of infinite consciousness. I am the feeling, the perception, the image-representation of this union and of this contradiction, and I am at the same time that in which these contraries are held together. I am that which endeavors to hold them

together, and I am the labor of the mind by which it tries to master this contradiction.

I am thus the relation between these two sides, which are not abstract determinations, like finite and infinite, but of which each is the totality itself. Each of these two extremes is the Ego—that which constitutes the relation, and which holds the extremes together. The relation is identical with the principles which are at strife within One, and which become One in this struggle. I am the struggle, for the struggle is naught but the contradiction which consists in the fact that those two are not in a state of indifference toward each other on account of being diverse, but are, on the contrary, tied to each other. I am not one of the two that are struggling, but I am the two combatants, and I am the struggle. I am the fire and the water which are here in contact, and I am the contact and the union of those that flee from each other; the contact is but the double, contradictory relation subsisting bewteen elements which are now separated and divided, and then again conciliated and united.

We shall see that the forms in which this relation of the two extremes exists are:

1. Feeling.
2. Sense-perception (Anschauung).
3. Image-representation (Vorstellung).

Before we enter into the sphere of these relations we shall have to cognize it in its necessity, inasmuch as this sphere, on account of being the elevation of the finite consciousness to the Absolute, contains the forms of religious consciousness. In exploring this necessity of religion, we shall have to look upon it as being posited by something else.

At the very beginning of this mediation, when it initiates us to the circle of those forms of consciousness, religion will appear to us as a result which is just cancelling this determination of being a result. Religion, consequently, will present itself as the first principle by which everything else is mediated and on which it depends. We shall thus see in that which has been mediated the interaction of movement and of necessity which move forward and repel at the same time. But this mediation of necessity should also be posited within religion itself, in order that the relation and essential connection of the two sides embraced by religious

spirit may be known as necessary. The forms of feeling, sense-perception, and image-representation, proceeding necessarily one from another, move onward into that sphere in which the inner mediation of their phases manifests its own necessity. The sphere in which this takes place is that of thinking; in it religious consciousness will grasp itself in its idea. These two mediations of necessity, of which one leads to religion, while the other takes place within religious self-consciousness itself, include the forms of religious consciousness as it appears in the forms of feeling, sense-perception, and image-representation.

3. THE ANNULMENT OF THE DIFFERENTIATION, OR THE CULTUS.

The movement in the preceding sphere is that of the idea of God or of the absolute Idea, by which it seeks to become objective to itself. This movement we find even in this statement of the idea: God is spirit. Spirit cannot be single individuality; it is spirit only by being objective to itself and by seeing itself in its other. The highest determination of spirit is self-consciousness, which implies this objectivity. God as Idea is subject for an object, and object for some subject. When the phase of subjectivity determines itself further, so that the distinction arises between God as object of thought and the thinking spirit, then the subjective side is determined in this difference as belonging to the side of finitude. These two, then, stand in contrast to each other in such a manner that their separation constitutes the contrast between finitude and infinity. But this infinity, on account of the contrast which still clings to it, is not the true one; the absolute object remains another existence for the subjective side (which is for itself), and the relation of the subjective to the absolute is not self-consciousness. There is also in this connection the relation that the finite in its separation knows itself to be transitory and naught, and its object to be the absolute and its own substance. Here the primary relation which takes place is that of fear toward the absolute object, because, compared with it, individuality knows itself to be accident, transitoriness, and evanescence. But this standpoint of separation is not a true standpoint, since it knows itself as being nugatory, as being in a state which should be cancelled; its relation is therefore not simply negative, but latently positive. The subject recognizes its own essence in the substance

into which it is to become merged through self-cancellation; it recognizes it as its own substance, in which, for this reason, self-consciousness will be preserved potentially. This union, conciliation, and rehabilitation of the subject and of its self-consciousness, the positive feeling that it participates and shares in the Absolute, and the wish to arrive at a real union with the latter, constitute a cancellation of the separation and form the phase of Cultus or worship. The Cultus comprises this whole inward and outward activity which has for its purpose the rehabilitation of the unity. The expression "Cultus" or "worship" is ordinarily used in the narrower sense of external, public actions; this definition does not lay stress on the inward activity of the soul. The meaning which we shall attach to the word Cultus will comprise this inward activity as well as its outward manifestation; this activity is to bring about the rehabilitation of the union with the Absolute, and is therefore an inner conversion of spirit and soul. The Christian Cultus or worship contains, for instance, not only the sacraments, church-rites, and duties, but also the so-called "way of salvation" which is an absolutely inward history and a succession of acts of the soul, a movement which is to take place, and does take place, within the soul.

In each stage of religion we shall find these two sides in correspondence with each other—namely, the side of self-consciousness, which is the Cultus or worship, and the side of consciousness, which is the image-representation.[1] The content of the concept of God, which is consciousness, is determined in the same way as the relation of the subject to Him, which is self-consciousness. The one phase is always the copy of the other, and ever suggests the other. One of these modes grasps the finite consciousness only, the other pure self-consciousness; both are therefore one-sided, and bear their annulment or cancellation in themselves.

[1] Translator's Note.—Hegel distinguishes between the Idea of God as consciousness and as self-consciousness. The mind may be conscious of God as of the Supreme Being which stands above him, and in whose existence in the universe he believes as firmly as that of the external objects which he sees in nature. He is conscious of God as the Ruler of heaven and universe. This is the consciousness of God as an external existence. But man sees the Divine not merely as an external existence; he feels that his own soul also is of divine origin and nature. When the Divine is recognized within, it is an act of self-consciousness. Hence religion is the cognition of the Divine without, or consciousness, and of the Divine within, or self-consciousness.

It was therefore a one-sided view, if the old, natural theology looked upon God as merely an object of consciousness. This view of the Idea of God may perhaps employ the words "spirit" or "person," but its real conception of God could never rise higher than to the idea of an Essence. It was inconsistent. If it had been consistent, it would certainly have arrived at the subjective side, or that of self-consciousness.

It is equally one-sided to look upon religion as subjectivity [or self-consciousness] only, for this would limit it to the subjective side altogether. It would make all cultus and worship perfectly barren and void; its actions would be a movement without progress; its direction toward God would be the relation to a nought, and have no definite aim. This merely subjective activity, too, is inconsistent, and must therefore cancel itself. For, if the subjective side is to have any determination at all, the concept of spirit implies that the latter is consciousness, and that its determination will become its object. The richer the mind and the fuller it is determined, the richer will be its object. The absoluteness of the feeling which is supposed to be substantial would necessarily imply that it disengages itself from its subjectivity; for the substantial element, which is said to be its characteristic, is certainly opposed to the accidents of mere opinion and inclination, since it is fixed in and for itself; it has in and for itself an objective existence and is independent of our feeling and sentiment. If the Substantial remained simply in our heart, it could not be recognized as the Supreme; God himself would remain something subjective, and the tendency of subjectivity would be like the drawing of lines into the void. The mere recognition of the Supreme, which this standpoint may express, is the recognition of an indefinite something which has no connection with any objective existence; the lines drawn toward it have no direction, and are and remain simply *our* activity, *our* lines—things that are altogether subjective. In this standpoint the finite never attains true and real self-alienation. It is necessary that in the cultus or worship spirit should free itself from its finitude and feel and know itself in God. Unless God has independent existence, and unless our relation to him is obligatory, all cultus shrinks into subjectivity. The cultus contains, as essential elements, the actions, immunities, assurances, confirmations, and attestations of some Supreme Existence. These definite

actions, real immunities and assurances, cannot take place if the objective and obligatory element is lacking in them, and it would be an annihilation of the cultus if the subjective side were considered the whole. It would cut off both the progress from consciousness to objective knowledge and the progress from subjective emotion to action. Each of these is most intimately connected with the other. Man's idea of his obligation in regard to God depends on his conception of God; his self-consciousness corresponds to his consciousness. Nor can he, conversely, conceive the idea of any definite obligatory action in regard to God if he has no knowledge or definite conception of Him as an objective Existence. Only when religion becomes a real relation and contains the difference of consciousness can the cultus assume its true form as the cancellation of alienation and become a living process. The movement of the cultus is not limited to this inwardness in which consciousness frees itself from its finitude and becomes consciousness of its essence; and in which the subject, knowing itself to be in God, enters into the fountain-head of its life. Instead of such limitation of the cultus, its infinite life begins to develop in the external direction also, for the subject's or individual's life in the world has substantial consciousness for its basis, and the manner in which the individual determines his aims in life depends on the consciousness of its essential truth. In this respect religion reflects itself in worldly affairs, and the knowledge of the world makes its appearance. This entrance into the real world is essential to religion, and in the transition to the world religion appears as morality in relation to the state and to its entire life. As the religion of a nation, so is its morality and political constitution. The latter depends altogether on the question whether a people has but a limited conception of the freedom of spirit or possesses the true consciousness of freedom.

We shall find, as further determinations of the cultus, the phase of presupposed unity, the sphere of differentiation and of freedom rehabilitating itself from this state of separation or differentiation.

a. The cultus, therefore, generally speaking, is the eternal process of the subject, by which it posits itself identical with its essence.

This process by which the previous diremption is cancelled seems to belong to the subjective side only; yet this determina-

tion is posited in the object of consciousness also. By the cultus, unity is attained; but that which was not united originally cannot be posited as united. This unity, which appears as action, or as the result of action, must also be cognized in a further phase, as being in-and-for-itself. For that which forms the object of consciousness is the Absolute, and the determination of the latter is, that it is the unity of its absoluteness with particularity. This unity is implied in the object itself, as, for instance, in the Christian idea of God becoming man.

CLASSIFICATION OF THE MATHEMATICAL SCIENCES.

BY J. M. LONG.

1. *Mathematics at the Base of the Sciences.*—Mathematics, in any true classification of the Sciences, must stand at the base. The science of education, as based on the law of mental evolution, determines the order in which the categories, or fundamental ideas, shall be arranged. This law of mental development is from the simple to the complex, from those subjects involving a few elements of thought to those involving many. This law requires that mathematics shall stand at the base of a classified scheme, for this form of scientific intelligence involves only the thought-elements of number and extension as associated with the ideas of time and space.

Space and time "are the conditions of all cognizable existence. Whatever exists, so far as is known or can be known to us, exists in space; and whatever acts, acts in time. Consequently the properties of space and time are conditions of all existence and all action; the laws under which things exist and act can not be proved, nor even stated, without express or implied reference to the properties of space and time. It results from this that mathematics, which is the science of the laws of space and time, is the necessary ground of physical science." — *Whewell.*

2. *Definition of Mathematics.*—In seeking a definition of mathematics, out of which all the parts shall be seen to unfold in logical

order, we may begin with the primary meaning of this form of intelligence. The term means primarily *learning;* and from the point of view of the Greeks, who had no other science, mathematics meant simply science in general. As this science relates in some way to quantity, it must mean to learn something concerning the relations of quantity as space, time, matter, motion, and force. The very name itself indicates how early in the historic development of the human mind man came to feel the value and importance of this form of intelligence to enable him to bring the order of his thought into correspondence with the order of external nature. Science confers the power of prevision; and mathematics gives the power of quantitative prevision which is the highest form of the scientific intelligence. This form of intelligence first attained to the stage of fully developed science because, although dealing with the most abstract relations, these are, at the same time, the most simple. Thought, it is true, unfolds from the concrete to the abstract; but this is not the controlling and sole law. Another principle comes in to determine the order in which the scientific intelligence unfolds, namely, *the law of least mental resistance to thought.* While mathematics deals with the most general and abstract relations, these are, at the same time, the most simple. The subject-matter of mathematics is the ideal world of space and time; geometrical forms and the combinations of number. The relations of space and time are the primary and fundamental relations of thought. Existence and activity are the two poles of thought, but existence has its background in space, and activity finds its field in time. It was much easier for the mind to discover the abstract properties of quantity than patiently to make inductions among the complex realities of concrete things.

The prime necessity of the scientific intelligence was *measurement.* Hence science has been appropriately called the *measurer.* Mathematics has therefore had its origin in the necessity of measuring distances, velocities, and dimensions which did not admit of direct measurement.

With these preliminary remarks respecting the development and purpose of mathematics as a science, we may now pass to a consideration of its definition. Comte, fixing his mind on the necessity which developed this form of intelligence into a science, defines mathematics as the science which has for its object *the in-*

direct measurement of magnitudes. The usual definition of mathematics as the science *which has for its object the measurement of magnitudes* is criticised by Comte on the ground that it is vague, and degrades mathematics into a mere art. The essential nature of science consists in the determination of certain phenomena by means of others—to infer the unknown from the known in accordance with certain fixed relations between them. Science, in all its forms, aims, so far as possible, to substitute *conception* for *perception*, according to which the ideal constructions of thought called the laws of nature confer upon the mind the power of prevision. Comte would therefore invest mathematics with the marks of science in general by more fully defining it as the science which has for its object "*to determine certain magnitudes from others by means of the precise relations between them.*"

This definition is adversely criticised by Professor Howison on the ground that it fails to connect mathematics as a science with the essential nature and properties of quantity in general. He says: "There being an elemental conception of intelligence called quantity, and mathematics having by universal consent some very important relation or other to that conception, it devolves upon a complete philosophy of mathematics to show precisely what that relation is, and the exact dialectic by which the conception arises in the process of intelligence, and unfolds itself into such phases as necessitate that general character of combined law-discovery and calculation which we have seen belongs to mathematics."[1] This point is well taken. Since mathematics as a form of the scientific intelligence has to do in some very important sense with *Quantity*, it is evident that, so long as this idea remains vague and obscure, the idea of mathematics cannot be clearly brought to light. But Prof. Howison, instead of giving the true definition of Quantity, proceeds to define mathematics thus: "*Mathematics is the science of the functional laws and transformations which enable us to convert figured extension and rated motion into number.*" This definition seems open to criticism. It would represent mathematics as dealing only with *continuous* quantity in the form of *extension* and *motion*, which it aims to convert into discrete quantity or number. But the phe-

[1] "Jour. Spec. Phil.," vol. v, p. 154.

nomena of nature afford as many examples of discrete quantity or number as they do of continuous quantity. In fact, the primary conception of quantity is that of number. Hence it is not the fundamental problem of mathematics to pass from continuous quantity to discrete quantity or number; this is only one of its problems. The *functional laws* spoken of, by which it is said figured extension and rated motion are converted into number, are the relations of equality which exist among the elements of quantity. All the transformations made in mathematical operations are arrived at by means of successive perceptions of equality among the elements of quantity. Hence we come down to the root of the matter only when we state that the fundamental problem or aim of mathematics is to establish relations of equality among the elements of quantity. Hence mathematics has a twofold object, namely, either to *compute* the numerical value of quantities by means of relations of equality, or to deduce from those same relations some property of numbers or of figured extension in the form of a line or space. If it be discrete quantity under consideration, then the aim is mere computation by means of some established unit of measure. If continuous quantity is to be dealt with, then the problem is to pass from this form of quantity to number, which alone answers the question *how many?* We define quantity, as mathematically conceived, *as whatever can be expressed in relations of absolute equality.* This definition attaches directly to mathematics as a form of the scientific intelligence, and therefore furnishes the data for a true definition of this science. The entire aim of mathematics, in all its processes, methods, and operations, is to deduce unknown magnitudes from those that are known, and to determine the properties of number and the forms of extension by means of the established relations of equality among the various elements of quantity. Mathematics may, therefore, be defined as *the science which has for its object to deduce unknown quantities from those that are known, and to determine the properties of number and figured extension by means of the relations of equality which exist among the elements of quantity.*

3. *The Fundamental Divisions of Mathematics.*—Comte, in his classification, divides mathematics into two fundamental divisions, the *concrete* and the *abstract*, making mechanics and geometry

concrete, while arithmetic, algebra, and the calculus, dealing with the laws and properties of numbers, he regards as abstract. The fatal objection to this division is that all science embodies both the concrete and the abstract, so that this principle cannot serve as a means of true, logical division. All the sciences, even the most abstract, like mathematics, have their basis in concrete realities, and attain to the stage of developed and exact science in the same degree in which the complex concretes are eliminated after their abstract values have been ascertained. In science, the particular, the sensible, and the concrete are transformed into the universal, the ideal, and the abstract.

Again, mathematics is the efficient instrument of all the physical sciences. The causes or physical forces of nature operate according to mathematical laws, and the effects produced must always depend upon the quantity of the acting agent. But mechanics is the door through which mathematics enters into combination with the other physical sciences. This it does by expressing the laws of *force* in terms of number and extension. But force in all the wide field of investigation opened up by the physical sciences is considered in the general laws or theory of force in the abstract independently of their concrete realities. Hence, viewed correctly, what is called applied mathematics is highly abstract in the nature of the problems which it considers. We thus see that to divide mathematics into *abstract* and *concrete*, or *pure* and *applied*, would be to include in this last division all the physical sciences so far as these have attained to the quantitative stage.

The true principle of division, we think, has been indicated in our definition. The object of mathematics is either to *compute* unknown quantities from those that are known, or to determine some property of figured extension. We quantify, measure, or compute the phenomena of nature by means of *number* and *ratio*. We thus have, as our first grand division, *Computative Mathematics*, the object of which is to bring phenomena under the category of number and ratio. The other grand division, as this relates to the sphere of figured extension, may be termed *Geometrical Mathematics*. Computative Mathematics, dealing with discrete quantity or number, has the means of evaluating or computing its own functions, while Geometrical Mathematics can only deter-

mine the functions of magnitude and form, but cannot compute them.

4. *The Subdivisions of Computative Mathematics.*—These are Arithmetic and Analysis, lower and higher.

(1) *Arithmetic.*—In Arithmetic we have as the fundamental idea that of number in its original and restricted sense, as this represents real and positive quantities. Being the science of number, as this represents concrete realities, it must hence furnish the ultimate test of the accuracy of the processes which belong to the higher mathematical branches when practical applications are made of these. It may therefore be defined as *the science of the ultimate evaluation of numbers.*

(2) *Analysis, Lower and Higher.*—The lower analysis, known as Algebra, differentiates from Arithmetic through the theory of the equation and the use of the minus sign, by which the conception of number becomes greatly extended. We now have both positive and real number, and also negative and imaginary number, both of which admit the same kind of operations. While, therefore, Arithmetic deals with numbers which represent relative magnitudes, Algebra deals with the general laws of numerical quantity without respect to the relative magnitudes.

The higher analysis, or Infinitesimal Calculus, differentiates from Algebra by the fact that while the latter arrives at its results by aid of equations established *directly* among the elements of quantity, the former arrives at its results by means of equations established *indirectly*—that is, by "equations primarily established, not between the quantities themselves, but between certain derivatives from them—of elements of them." With this fundamental object in view, the Calculus naturally divides into two coordinate branches. In the Differential Calculus the problem is to pass from the given finite elements to the formation of a differential equation; in the Integral Calculus the problem is to deduce from the given differential equation an ordinary algebraic equation expressing finite values.

The logic of the Calculus has been a subject of discussion among learned men from Berkeley down to the present time. Two theories have contended for the mastery, the conception or principle of *limits*, as adopted by Newton, and the theory of infinitesimals, as adopted by Leibnitz. "The conception or principle of limits is

now universally adopted in establishing the foundations of the Transcendental Analysis by all vigorous logicians; nor is it easy to see that any other course is open."—*Nichol.*

5. *Subdivisions of Geometrical Mathematics.* — Geometrical Mathematics, dealing with *magnitude* and *form*, as given in space, subdivides into two main branches. The first has for its object to establish the theorems relating to the qualities and dimensions of magnitude and form as the result of extension and position. We may properly term this *Demonstrative Geometry*, because its method is that of *demonstration* by means of axioms, definitions, and other theorems. The other subdivision does not use demonstration, but treats of the method of representing magnitudes and form by proportional drawing. We may call this *Constructive Geometry.*

6. *Divisions of Demonstrative Geometry.*—Demonstrative Geometry divides into two co-ordinate branches, namely, *qualitative* and *quantitative* geometry. The first has for its object to establish the properties of pure space, viewed as magnitude and form. In Qualitative Geometry, the properties of extension, as these relate to magnitude and form, are studied, classified, and reduced to general types, just as the properties of other objects are observed, classed, and generalized.

This branch embraces the two branches known as Synthetic and Analytic Geometry. These both deal with spatial magnitude and form; but in Synthetic Geometry the idea of form is taken for granted, while the leading idea relates to properties of magnitude. In Analytic Geometry, the fundamental idea is the properties of form, while magnitude becomes the subordinate idea. The terms synthetic and analytic express true distinctions. The former develops its truths deductively or synthetically, while the latter is essentially analytic in its method. The first we may term the Geometry of Magnitude, the latter the Geometry of Form.

The other branch of Demonstrative Geometry, which we have termed *quantitative* or metrical geometry, has for its object the establishment of theorems relating to the measurement of magnitudes by the introduction of algebraic notation and arithmetical units. Demonstrative Geometry, as we have seen, can establish theorems relating to magnitude, but is unable to compute or evaluate their functions. To do this, it must call in the aid of

Computative Mathematics. We may have, in the first place, the measurement of magnitudes in the form of lines, surfaces, and various kinds of solids, by the simple use of arithmetical processes. This goes by the name of *Mensuration*. In the second place, we may have the measurement of plane and spherical triangles by means of general formulæ established by algebraic processes. This gives us Trigonometry, plane and spherical.

7. *Constructive Geometry.*—The other grand division of this branch of mathematics is termed, as we have seen, *Constructive Geometry*. In opposition to the pure Demonstrative Geometry, which deals with the ideal and abstract relations of magnitude by reasoning synthetically and analytically, there arises a new branch of Geometry, self-contained and independent. The object of this branch of mathematics is to determine by proportional diagrams "the total linear or superficial value of a required part of a plane figure or of a solid, without calling in the aid of any calculation whatever." This divides into Graphics and Descriptive Geometry. We may describe the method of the former as *direct*, since the required part is itself drawn and measured. The method of the latter is, on the contrary, *indirect*, since its object is the construction of the parts of solid figures which cannot be directly drawn on a flat surface. This was the brilliant invention of Monge, who substituted for the parts of the figures themselves their projections upon auxiliary planes.

For the full presentation of all the foregoing branches of mathematics, with their definitions, the reader is referred to the following tabulated view, to be read as an ascending and unfolding series. The definitions, like all definitions, are open to criticism, and may be improved.

MATHEMATICS is the science which has for its object to determine the properties of number and the forms and magnitudes of figured extension, and to evaluate the same by means of the relations of equality which exist among the elements of *Quantity*.

- **II. Geometrical Mathematics, the science of extensive Quantity.** [*To be read from the bottom upward.*]
  - **CONSTRUCTIVE GEOMETRY.**—Treating of the method of representing magnitudes by proportional drawing.
    - **DESCRIPTIVE GEOMETRY**, using indirect methods in constructing solid figures.
    - **GRAPHICS**, using direct methods in constructing plane figures.
  - **DEMONSTRATIVE GEOMETRY.**—Establishing the theorems relating to the qualities and quantities of magnitude and form.
    - **QUANTITATIVE GEOMETRY**, treating of the quantities of magnitude and form.
      - Trigonometry { Spherical. Plane.
      - Mensuration.
    - **QUALITATIVE GEOMETRY**, treating of the qualities of *magnitude* and *form*.
      - *Analytical Geometry*, establishing theorems of form by algebraic notation.
      - *Synthetic Geometry*, establishing theorems of magnitude by axioms, definitions, and other theorems.
- **I. Computative Mathematics, treating of the general science of Numbers.**
  - **ANALYSIS.**—Expressing by means of the equation the general relation of numbers, and the methods by which those that are unknown may be deduced from those that are known.
    - **CALCULUS**, dealing with the finite elements of quantity, the relations of which can be formulated only *indirectly* by the relations of infinitesimal quantities.
      - The Calculus of variable forms, in which the finite elements undergo constant change.
      - The Calculus of constant forms, in which the finite elements remain unchanged.
    - **ALGEBRA**, dealing with quantities the numerical relations of which can be formulated *directly* by means of signs and symbols.
  - **ARITHMETIC**, having for its object the ultimate evaluation of Quantity.

CONCORD SUMMER SCHOOL OF PHILOSOPHY.

Hints to Students for the Course of 1887.

It has seemed to the Faculty of the Concord School that the usefulness of the institution might be increased, if those who attend its sessions were to come prepared by previous reading to take part in the discussions. At the close of last session, therefore, it was resolved to prepare and circulate, at an early date, a programme of the lectures for the coming year, as far as it could be made out, and, along therewith, a list of books likely to be of value to intending students. At the same time, a committee was appointed to give direction and aid to such students as might choose to apply for the same.

Courses of Lectures in 1887.

The main subject of the lectures in 1887 will be Aristotle *and his Philosophy, in its Relation to Modern Thought.* There will be three courses, — two general, and one special. The first, which will be given in the mornings of the session, will deal with Aristotle's philosophic system as a whole, endeavoring to give a complete and, as far as possible, an exhaustive, account of it, its origin and influence, and to determine the points of identity and difference between it and the thought of recent times, since Bacon, Descartes, and Locke. The other general course, which will be given in the evening, will treat, among other themes, of Aristotle's art doctrines, and particularly of his dramatic theory, comparing it with modern theories, and also comparing the Greek with the modern drama, especially with Shakespeare. The special course, or "Symposium," will be devoted to Ontology, and will endeavor to determine whether, and how far, such a science is possible, and how its possibility or impossibility must affect science, ethics, art, and religion. In this

course, also, the thought of Aristotle will be compared with that of our own time.

Aristotle's philosophy presents to us the ripest and most comprehensive thought of the ancient world. No other philosophy, at least in the Western world, ever exerted an influence so profound, extensive, and enduring. To the ancients, Aristotle was "Nature's private secretary;" to the Middle Ages, after 1150, he was simply "The Philosopher," or "The Master of those that know;" and, though, for a brief period, his sun was eclipsed by reactionary influences, philosophers of nearly all modern schools, as well as scientists and poets, have vied with each other in doing him honor. Among these may be named Leibniz, Lessing, Göthe, Hegel, Cuvier, Bain. A comprehensive knowledge of Aristotle's system can hardly fail to be productive of two advantages to the student. *First*, it must add greatly to his knowledge of philosophy; *second*, it must place him in a position to appreciate the character, the limitations, and the exaggerations of our current systems. Indeed, its many-sidedness is the best possible corrective for the one-sided thought of to-day. It is scientific without materialism, and spiritual without mysticism. While this is true with respect to Aristotle's system as a whole, it is especially true of those parts which treat of First Principles, Theory of Cognition, and Art.

The following is a provisional programme of all the courses. Any changes that may hereafter be rendered necessary will be in the direction of the list of "General Topics" appended to the programme adopted.

LECTURES AT THE CONCORD SCHOOL, 1887.

There will be two courses, morning and evening, beginning at 9.30 A. M., on Wednesday, July 13, 1887, — the topics being as follows: —

I. Twelve Morning Lectures on ARISTOTLE.

Aristotle's Doctrine of Reason.

Aristotle's Theory of Sense-Perception, in the light of Recent Psychology.

Aristotle's Logical Treatises.

Aristotle's Theory of the Syllogism, compared with that of Hegel.
Aristotle and the Scholastic Philosophy.
The Ethics of Aristotle.
Aristotle's History of Animals.
Bacon and Aristotle.
The Political Philosophy of Aristotle.
Social Science in Plato and Aristotle.
Aristotle and the Christian Church.
The Protestant Reaction against Aristotle.

II. Ten Evening Lectures on DRAMATIC POETRY.

The Poetics of Aristotle, in its Application to the Drama.
The Tragic Element in the Greek Drama and in the Norse Edda.
Shakespeare's Poetics.
The Divine Nemesis in Æschylus and Shakespeare.
The Collision of Individuals with Institutions in the Greek, and the English, Drama.
Women in Greek Tragedy and in the Elizabethan Drama.
Acting of Plays in Ancient and Modern Theatres.
Marlowe and his Successors.
Ford and Massinger.
Browning's Dramatic Genius.

III. Four brief Papers on ONTOLOGY, in two or three sessions.

GENERAL TOPICS FOR ADVANCED STUDENTS.

1. Aristotle's Life and Times. Condition of Science, Education, Morals, Religion, and Art.
2. Aristotle's Teachers. His Studies and his Relations to previous Thinkers, Greek and foreign (Hindu).
3. Aristotle's Writings, their Nature, their History, and their Influence in Ancient Times.
4. Aristotle in the Mediæval World, — among Jews, Syrians, Arabs, and Schoolmen. Reaction against Aristotle; its Causes.
5. Aristotle's conception of Science, its Divisions and Limits, compared with the conceptions of Positivists, — Comte, Spencer, etc.
6. Aristotle's Scientific Method compared with those of Bacon, Descartes, and Hegel.

7. Aristotle's Logic compared with the Logics of Hegel and Mill.
8. Aristotle's Psychology compared with that of the modern English School, as to Method and Results.
9. Aristotle's Ethics compared with the more important Systems of Modern Times, — those of Kant, Rosmini, etc.
10. Aristotle's Theory of the State (particularly in relation to the Individual), compared with Modern Views on the same subject.
11. Aristotle's Views on Education and on the State's Relation to it, compared with Modern Views on the same subject.
12. Aristotle's Views on Profit and Interest, compared with Modern Views.
13. Aristotle as a Natural Scientist, — Astronomer, Physiologist, Zoölogist, etc., — and his effect upon the progress of Modern Science.

Aristotle's Æsthetics.

1. Aristotle's Doctrine of the nature of the Art-Activity, and its relation to the other powers of the Mind, compared with modern notions.
2. Aristotle's Doctrine of the purpose of Art, and particularly of the Drama (*κάθαρσις*, purification), compared with modern notions (Lessing, Göthe, etc.).
3. The Greek and English Dramas, their Origin (social and religious conditions), Form, and Function. Character and Plot.
4. Tragic Guilt in the Greek Tragedians, in Shakespeare, and in Göthe.
5. Orestes and Hamlet.
6. The three Iphigenias (of Euripides, Racine, Göthe).
7. Medea and Brunhild. (The Ancient and the Modern Woman in Art.)

Theory of Cognition and Ontology.

1. Aristotle's Theory of Cognition, compared with those of Locke, Berkeley, and Kant.
2. The relation between Theory of Cognition and Ontology. How Modern Phenomenalism and Associational Psychology make Ontology impossible.
3. Aristotle's Doctrine of Form and Matter, and its relation to Modern Thought, especially to Atomism.
4. Aristotle's Doctrine of Potence and Act, and its relation to the modern doctrines of the Thing-in-itself and the Unknowable.
5. On Being, and its various significations. Its relation to Intellect.
6. Aristotle's Doctrine of Causes, compared with modern doctrines.

Suggestions to those beginning the study of Aristotle.

I. The Metaphysics.

1. Study Aristotle's definitions and descriptions of real being (*οὐσία*, variously translated "essence," "substance," "true nature," "entity," "being," "real substance," "subsistence," "essential nature," etc.). See Book VI. ch. 3, where its definitions are inventoried; as (*a*) Formal Cause (*τὸ τί ἦν εἶναι*, i. e. the totality of distinctions that belong to the nature of the thing); (*b*) the Universal (*τὸ καθόλου*); (*c*) the Generic (*τὸ γένος*); and (*d*) the Subject or Thing-in-Itself (*τὸ ὑποκείμενον*). (See Book IV. chapter 28; Book VII. chap. 1.) Compare these definitions with the definition given in Book III. of *The Physics*, chapter 5 of *The Categories*, and note the discrimination given in the latter between first and second "real beings."

2. Study in like manner the definitions and descriptions of Formal Cause (*τὸ εἶδος* or *τὸ τί ἦν εἶναι*), noting its inclusion or exclusion of the other causes; namely (*a*) Efficient Cause of Motion (*τὸ ὅθεν ἡ ἀρχὴ τῆς κινήσεως*), or (*b*) Final Cause or Purpose (*τὸ οὗ ἕνεκεν*). (Book I. ch. 3; Book VI. chs. 7 and 17.) Does the Formal Cause always denote energy?

3. Note that definition (*ὁρισμός*) is the principle (*λόγος*) of the Formal Cause, and inquire whether *εἶδος* and *ἐνέργεια* are identical (Book VII. ch. 2), and whether energy is also Final Cause or Purpose (*τὸ οὗ ἕνεκεν*). (See Book VIII. ch. 5.)

4. Note the agreement and difference of the Material Cause (*ἡ ὕλη*), the Subject (*τὸ ὑποκείμενον*), and Potentiality (*δύναμις*, translated also "capacity," "potence," etc.). Consider in connection with these the doctrine that Form and Energy are necessary to give any reality to these categories.

5. Read Books X. and XI. together as the Theology of Aristotle. Noting the three kinds of change (Book X. ch. 11),— (*a*) from Subject to Subject, (*b*) Generation, and (*c*) Corruption, compare this with the statement that motion affects only two categories,— quantity and quality (Book X. ch. 12). Note also that movement and change are here discriminated, change

having four species; but that there are no universal causes in nature (Book XI. ch. 5); that all causes are in energies which are real beings (*οὐσίαι*), and that "energies" precede all movements. Compare with *De Anima*, Book I., ch. 3.

6. Consider the doctrine that all motion originates in an unmoved first principle which is of necessity eternal (Book XI. ch. 6); that the unmoved eternal energy which is presupposed by every movement or change in the world, is pure self-knowing (*τὸ θεωρεῖν*), (a living personal divine reason). (Book XI. ch. 7.) (This seventh chapter, the most wonderful chapter in Greek philosophy.)

7. The earth and the stars receive their movement from the divine energy (Book XI. ch. 8).

8. Study together Books IX., XII., and XIII., as directed against Pythagoras and Plato, — a refutation of the principle of contrariety or polarity as world-principle, and the discussion of what constitutes real independent existence (*οὐσία*), energy (Is energy the unity of formal, efficient, and final causes?) being requisite to true individuality. Does contrariety always presuppose energy as its ground? (Book XIII., and *Physics*, Book I. ch. 4.)

9. The true first principle, the Good (*τὸ ἀγαθόν*) (Book XIII. ch. 5). Is "the Good" understood to mean that which helps others and affirms the being and individuality of others, — i. e. is it "altruism"? How is the doctrine that all evil arises from matter (*ὕλη*), and is good *in potentia*, to be understood?

10. Use Book IV. as a glossary, always comparing definitions given there with those given elsewhere.

II. The Logical Treatises.

1. Note the ten Categories and their definitions, especially the definitions of *οὐσία* and its two kinds, and of *κίνησις* with its six species (*The Categories*, chs. 4, 5, and 14).

2. Note the doctrine regarding universals (*τὰ καθόλου*) and singulars (*τὰ καθ' ἕκαστον*) (*Interpretation*, ch. 7); also of necessary judgments as referring to persistent energies (ch. 9).

3. In the *Prior Analytics*, learn carefully the doctrine of the three figures and fourteen valid modes of the syllogism.

4. Inquire into the practical use of these figures in cognition. (*a*) Do we not always use the second figure in recognizing the object of sense-perception as belonging to classes already known by us? (*b*) Do we not use the first figure after the second figure? Having recognized the class to which the object belongs, do we draw out by inference the store of experience already preserved in our knowledge of the class? (*c*) Finally, inquire as to the use of the third figure in the identification of causal activities in nature, — of two predicates to an object, whether one may be identified as cause and the other as effect, — and whether this figure is the logical instrument of discovery? (*Prior Anal.* Book I. chs. 1–7.) Consider whether the invalid modes of the second and third figures are not by far the most useful in obtaining knowledge.

5. In the *Posterior Analytics* (Book I. ch. 24), note the hint as to the relation of the Universal to the causal principle, and of particular knowledge to general knowledge.

6. The definition of Science (Book I. chs. 27, 28, 29, 30), and the asserted impossibility of reaching science through the senses.

7. The four things investigated by science: (*a*) that a thing is (τὸ ὅτι); (*b*) why it is (τὸ διότι); (*c*) if it is (εἰ ἔστι); and (*d*) what it is (τί ἐστι). (*Posterior Analytics*, Book II. ch. 1.)

8. How definition differs from demonstration (*Posterior Analytics*, Book II. ch. 3), and that the middle term expresses the definition (*ibid.* ch. 4). On the whole subject of definition, see chapter 13 (*ibid.*); and how the Universal arises in the mind, chapter 19 (ch. 15, Tauchnitz ed.).

9. Study the distinction between universal and dialectic syllogisms (*Topica*, Book I. ch. 1), and inquire whether and how probabilities can be elevated into certainties.

10. Note the important logical principles in Book I. chs. 6, 7, 8, and 9, regarding the subversion or overthrow of definition; the predication of the identical; the reference of all questions to definition, genus, property, and accident; and the limitation of definition to the genera of the ten categories.

11. Induction in chapter 12 of Book I. defined as a progression from singulars to universals; and its difference from the syllogism.

III. The Psychology. *De Anima.*

1. Note that motion (*κίνησις*) includes locomotion (*φορά*), alteration or change (*ἀλλοίωσις*), decay (*φθίσις*), and increase or growth (*αὔξησις*); and, since these all involve potentiality not realized, while the soul is pure energy without potentiality, the soul is not any kind of motion or change (Book I. ch. 3).

2. Note the relations of the categories *ἐνέργεια, ἐντελέχεια* (first and second grades of the latter), and *δύναμις* as used in Book II. ch. 1, in defining the soul. Does "independent individuality" express *ἐντελέχεια*? Compare science (*ἐπιστήμη*) with immediate insight (*τὸ θεωρεῖν*) (Book II. ch. 1). Does Aristotle's definition (Book II. ch. 1) make the body and soul inseparable?

3. Consider (Book II. ch. 2) the assertion that the soul is *form* rather than *matter*, and that True Being (*οὐσία*) is form (*εἶδος*), because matter (*ὕλη*) is only the *potentiality* (*δύναμις*), while form is the *entelechy*.

4. Distinguish the three stages of psychic existence: (*a*) nutritive (*τὸ θρεπτικόν*), (*b*) sensitive (*τὸ αἰσθητικόν*), and (*c*) rational (*διανοητικόν*) (Book II. ch. 2), noting especially what is said in regard to the sensitive, namely, that it receives the *form* only but does not receive the *matter* of the perceived object into itself, — and inquiring whether this doctrine does not make even sense-perception a self-activity or energy. Remember in this connection the function of the second figure of the syllogism, already adverted to above, namely, that it is by the recognition of the class (a universal) as identical with what is already known, that any sense-perception at all takes place.

5. Most important is the further doctrine that objects require a rational nature in order to be known at all (Book III. ch. 4). The act of recognition through the second figure just alluded to could not take place unless the objects possessed predicates identical with *a priori* categories of the mind.

6. The doctrine of the reason (*νοῦς*) (Book III. chs. 4, 5, 6). Reason is twofold: active (*τὸ ποιοῦν*) (Book III. ch. 5, sect. 2) and passive (*παθητικός*) (Book III. ch. 5, sect. 2). The active

as creator of all things (*τῷ πάντα ποιεῖν*) because the perceptibility of objects proves their origin from a rational creator or creative cause (*τὸ αἴτιον καὶ ποιητικόν*).

The passive reason has the power to become all things (*τῷ πάντα γίνεσθαι*), that is to say, to assume objectivity in all cases of sense-perception, or to be used in all examples of the second figure.

7. But the active reason is separable from the body, and immortal and eternal (Book III. ch. 5), and is always active, though we are unconscious of its unbroken continuity in action, because it is not affected by objects (*ἀπαθές*), while the memory, sense-perception, and imagination, which make up the *νοῦς παθητικός*, are perishable. (Why? Because we continually proceed from *ἐπιστήμη* to *θεωρεῖν*, that is to say, from the consideration of particular facts up to the familiar knowledge of causes and principles, which we know apart from the examples that illustrate them. The knowledge which by memory has to hold fast its illustrative facts does not yet see the principle clearly, and its knowledge is perishable, — not hereafter, but here. Such knowledge as is held in the memory is essentially perishable, though it will long outlast this earthly life.) This active reason is the *entelechy* of human beings — their true individuality — and not a mere incarnation of a general World-Soul, because it is required in each case to make the act of cognition possible, even in the lowest sense-perception (*καὶ ἄνευ τούτου οὐθὲν νοεῖ*) (Book III. ch. 5, at end). The active reason is the principle of individuation; therefore, our conscious ego. For the fact that we attain to insight (*θεωρεῖν*) proves this. Our ability to think pure form as found in the categories, which are universals and devoid of matter derived from experience, and are without images from time and space, is an exercise of our true individuality (*ἐντελέχεια*), the active reason.

IV. The Ethics. — (Nicomachean.)

1. Note, in connection with themes already mentioned, the discussion of true science (Book VI. ch. 6).

The reason (*νοῦς*) as the source of principles (*ἀρχαί*) (Book

VI. ch. 3), and the distinction of the understanding (*διάνοια*) from the reason (*νοῦς*).

2. Reason the principle of individuation (that which makes us persons) (Book X.); and the source of the highest happiness of man as well as of the gods is *θεωρία*.

3. For the ethical content of the work study chiefly Book III., which sets forth the doctrine of deliberate choice (*προαίρεσις*), and Book II. for the doctrine of the Mean (*μεσότης*).

V. The Physics.

1. Subjects treated elsewhere, especially in Books X. and XI. of the *Metaphysics*, are to be studied also in the *Physics* on account of the explicitness of treatment here. The four causes (Book II. ch. 3; see *Metaphysics*, Book I., and *De Anima*, Book II. ch. 1). A thorough discussion of movement (*κίνησις*) and of its relation to potentiality (*δύναμις*) is given in the Third Book, together with a polemic against the *infinite* (*τὸ ἄπειρον*) in the sense of the *indefinite*. In Book IV. ch. 12, note the important observation that all that has potentiality belongs to time.

2. Motion from its own nature is derivative, and always presupposes an origin beyond itself, and a first mover, that is itself unmoved (Book VII. ch. 1, and Book VIII. chs. 3, 4, 5, 6).

Motion must not be predicated of thoughts, of ideas, or of eternal things, but only of objects of sense-perception (Book VII. ch. 3). Eternal motion is circular motion (Book VIII. chs. 1, 2, 8, 9, 10).

3. Note especially what is said of Time in Book IV. (chapters 10 to 14).

VI. The Poetics.

1. All poetry Imitation (chapters 1, 2, 3). Inquire into the meaning of *μίμησις* (ch. 5) and *μιμεῖσθαι*, as used by Plato (see *Laws*, Z 812 c; *Republic*, Book III. 394 b; *Sophist*, 265 A), and in this work of Aristotle's. Does it mean impersonations only; or does it hint of the deeper activity of man, — of his symbol-making capacity, a mythopœic faculty, and thus the fundamental art-faculty?

2. Study chapter 6 on the parts of tragedy, and the famous definition of it which states its object to be the purification of man (*κάθαρσις*) from like passions to those represented, by pity and fear. Note that this *katharsis* takes place through the vicarious nature of human experience, or the power of learning through the spectacle of another's experience. (See *Politics*, Book VIII. ch. 7.)

3. A dramatic whole and tragic action (ch. 7). The requirements of the plot and the unity of the drama (ch. 8). Parts of a tragedy (ch. 12), and the essentials of a tragic plot (chs. 13 and 14). The significance of *τὸ φοβερόν* and *τὸ ἐλεεινόν*.

4. Poetry more philosophical and worthy of attention than history (ch. 9). Trace out the comparison,— history treating of *τὰ καθ' ἕκαστον*, and poetry of *τὰ καθόλου*.

5. Note that deliberate choice (*προαίρεσις*) (see *Nicomachean Ethics*, Book III.) is essential to the characters portrayed in tragedy. Their disposition and behavior, their manner of life (*τὸ ἦθος*), their ethical character, should be based on free-will, or else they cannot be made responsible for their fate. (ch. 15.)

6. Note the four kinds of tragedy (ch. 18); the description of epic poetry; and the distinction between epopee and tragedy.

VII. Parts of Animals.

1. The best statements on the method of natural science, its subject and form, are to be found in the treatise on the *Parts of Animals* (*περὶ ζῴων μορίων*) (Book I. ch. 1). Investigation should look especially to the form, but the soul is something higher than the form. The universal before the particular, and the cause before the effect, should be studied in order to find true science (Book I. ch. 5).

2. The principle of division and classification is discussed in chapter 2, and the defects of dichotomy and the principle of contrariety, or polarity, as a basis of classification are exposed — "there can be no genera in the negative." The true basis should be sought in the idea of genus and species (looking at the productive causes of variety). The advantages of this

method over that which proceeds from the individuals. (The whole of the first book, but especially chapters 1, 2, and 5.)

3. Nothing in nature so insignificant as to be unworthy of attention (*ἐν πᾶσι γὰρ τοῖς φυσικοῖς ἔνεστί τι θαυμαστόν*) (Book I. ch. 5).

VIII. *De Coelo.*

1. In the work on the heavens (*περὶ οὐρανοῦ*), note the quantitative aspect as the essence of body (Book I. ch. 1); circular movement as the true and highest form of motion. (Since movement is always impelled by an outside mover, it must be essentially of a relative character; and motion with constant relation to a fixed point must be circular.) (Book I. ch. 1, and Book II. chs. 3, 4, 5.) (The most important thoughts on this subject are to be found in the *Metaphysics* (Book XI. ch. 8).)

2. Note what is said about death as appertaining to all that existence which has been generated, or caused through another (Book I. ch. 12).

3. Of great interest is the reference (*De Coelo*, Book II. ch. 14) to proofs of the earth's rotundity and its size,—its shadow on the moon; the method of measuring a degree on the meridian by the altitude of given stars; and the circumference of the earth estimated at over 40,000 miles (400,000 stadia = 45,200 miles): nevertheless Aristotle regards the earth as one of the smallest of the heavenly bodies.

4. In the treatise on Meteorology (Book I.) there is a discussion of the relation of terrestrial movements to celestial.

IX. Politics.

1. In Aristotle's *Politics* note in Book IV. (chs. 14, 15, 16; or 12, 13, 14, Tauchnitz ed.) the three departments necessary to a State: (*a*) the Deliberative Assembly (*ἐκκλησία* or *τὸ βουλευόμενον περὶ κοινῶν*); (*b*) the Executive Officers of the state (*αἱ ἀρχαί*); (*c*) the Judiciary (*τὸ δικάζον*).

2. Do we see in these departments Aristotle's notion of the three essential logical categories which constitute the fundamental form (*εἶδος* or *τὸ τί ἦν εἶναι*) of the intellect,—to wit, (*a*) the Universal (*τὸ καθόλου*), or the legislative department that an-

nounces the general laws; (*b*) the Particular (*τὸ μέρει*), the law-applying power or the judiciary; (*c*) the Singular or Individual (*τὸ καθ' ἕκαστον*), the executive which sums up the personal might of the state in the form of the individual officer?

3. Note, however, that the *ἐκκλησία*, besides its proper legislative duties of making laws, declaring war, concluding treaties, also exercised, according to Aristotle, judicial functions, inasmuch as it pronounced death-sentences, banishments, confiscations, and impeachments. The executive department (*αἱ ἀρχαί*) also has legislative functions (Book IV. ch. 12), (*βουλεύσασθαί τε περὶ τινῶν*), and judicial functions (*κρῖναι*), as well as purely executive ones, though the latter are regarded by Aristotle as peculiarly its province (*ἐπιτάξαι καὶ μάλιστα τοῦτο*). (The necessity of the complete separation and independence of these departments has been realized only in modern times.)

ENCOMIA.

Aristotle, Nature's private secretary, dipping his pen in intellect. — *Eusebius, Suidas.*

Aristotle, in my opinion, stands almost alone in philosophy. — *Cicero.*

Wherever the divine Wisdom of Aristotle has opened its mouth, the wisdom of others, it seems to me, is to be disregarded. — *Dante.*

I could soon get over Aristotle's *prestige*, if I could only get over his reasons. — *Lessing.*

If, now in my quiet days, I had youthful faculties at my command, I should devote myself to Greek, in spite of all the difficulties I know: Nature and Aristotle should be my sole study. It is beyond all conception what that man espied, saw, beheld, remarked, observed. To be sure he was sometimes hasty in his explanations; but are we not so, even to the present day? — *Göthe* (at 78).

If the proper earnestness prevailed in philosophy, nothing would be more worthy of establishing than a foundation for a special lectureship on Aristotle; for he is, of all the ancients, the most worthy of study. — *Hegel.*

Aristotle was one of the richest and most comprehensive geniuses that ever appeared — a man beside whom no age has an equal to place. — *Hegel.*

Physical philosophy occupies itself with the general qualities of matter. It is an abstraction from the dynamic manifestations of the different kinds of matter; and even where its foundations were first laid, in the eight books of Aristotle's *Physical Lectures*, all the phenomena of nature are represented as the motive vital activity of a universal world-force. — *Alexander von Humboldt.*

It was characteristic of this extraordinary genius to work at both ends of the scientific process. He was alike a devotee to facts and a master of the highest abstractions. — *Alexander Bain.*

Aristotle is the *Father of the Inductive Method*, and he is so for two reasons. First, he theoretically recognized its essential principles with a clearness, and exhibited them with a conviction, which strike the modern man with amazement, and then he made the first comprehensive attempt to apply them to all the science of the Greeks. — *Wilhelm Oncken.*

BIBLIOGRAPHY.

In the preparation of the following list of books, no attempt has been made to give an exhaustive Bibliography. The purpose has been to name some of the more serviceable works, and, among these, those most easily obtained. It is unfortunate that English literature is poor in works on Aristotle. This must be the excuse for the naming of books in other languages.

In preparing for the above courses, the student must first acquire a general notion of Aristotle and his system. To this end he may consult —

* Grant (Sir Alexander), *Aristotle* (Edinburgh, Blackwood, 1877, 12mo).

Lewes (Geo. H.), *Aristotle. A Chapter from the History of Science* (London, Smith, 1864, 8vo. A superficial work).

Grote (George), *Aristotle* (London, Murray, 1872, 2 vols. 8vo. Contains a good Life of Aristotle).

Biese (Franz), *Die Philosophie des Aristoteles in ihrem inneren Zusammenhang*, etc. (Berlin, Reimer, 1835, 2 vols. 8vo. Written from an Hegelian standpoint).

* Rosmini (Antonio), *Aristotele Esposto ed Esaminato* (Turin, Società Editrice, 1858, 8vo. Written in an adverse spirit, but very able).

Along with these books may be read the chapters on Aristotle in the best histories of philosophy, * Hegel's, * Schwegler's, * Erdmann's, Zeller's (Greek Phil.), and * Ueberweg's. Of Schwegler's history there are two translations, one by Dr. Hutchison Stirling, and one by Dr. Julius H. Seelye. * Zeller's *History of Greek Philosophy* (translation by Sarah F. Alleyne, O. J. Reichel, Alfred Goodwin, and Evelyn Abbott, London, 1876 to 1886, 12mo, 6 vols. so far) contains the best existing summary of Aristotle's Philosophy. The translation of * Ueberweg's *Manual*, by Prof. Geo. S. Morris (New York, Scribner, 1872–4, 2 vols. large 8vo), is a work which no student of philosophy can afford to be without. *It contains a good Aristotelian Bibliography.*

On the works of Aristotle, and their history in ancient times, may be read —

Rose (Valentin), *De Aristotelis Librorum Ordine et Auctoritate* (Berlin, Reimer, 1854, 8vo), and *Aristoteles Pseudepigraphus* (Leipzig, Teubner, 1863, 8vo).

* Heitz (Emil), *Die verlornen Schriften des Aristoteles* (Leipzig, Teubner, 1865, 8vo).

* Stahr (Adolf), *Aristotelia* (Halle, Waisenhaus, 1830–2, 2 vols. 8vo. Contains an excellent life of Aristotle, and the history of his writings in the ancient world).

* Bernays (Jacob), *Die Dialoge des Aristoteles in ihrem Verhältniss zu seinen übrigen Werken* (Berlin, Hertz, 1863, 4to, pp. 178).

On the history and influence of Aristotle's works in the Middle Ages may be read —

* Jourdain (Am.), *Recherches Critiques sur l'Age et l'Origine des Traductions latines d'Aristote et sur les Commentaires grecs ou arabes employés par les Docteurs scolastiques*, Paris, 1819 and 1843, 8vo (Ger. Trans. by Stahr, Halle, 1831).

Hauréau (Barth.), *De la Philosophie Scolastique* (Paris, 1872, 2 vols. 8vo).

Prantl (Carl), *Geschichte der Logik im Abendlande* (Leipzig, Hirzel, 1855 sqq., 4 vols. 8vo).

* Schneid (Math.), *Aristoteles in der Scholastik* (Eichstätt, Hugendubel, 1875, 8vo).

TALAMO (Salvatore), *L'Aristotelismo della Scolastica nella Storia della Filosofia* (Naples, Fibreno, 1863, 8vo. There is a later edition).

The student, after having acquainted himself with the general outline of Aristotle's system, should turn to his works and read the chief of them. Of the extant works of Aristotle there are two complete editions readily accessible, viz: —

Aristoteles Græce. Ex Recognitione IMMAN. BEKKERI (Berlin, Reimer, 1831–70, 5 vols. 4to. Known as the Berlin edition. Vols. I and II contain the Greek text; Vol. III, a Latin translation; Vol. IV, Scholia; Vol. V, the Scholia of Syrianus, the Fragments of Aristotle's lost works, and an extensive and most valuable *Index Aristotelicus*).

Aristotelis Opera Omnia Græce et Latine, cum Indice Nominum et Rerum absolutissimo (Paris, Didot, 6 vols. 4to. This is known as the Paris edition. The very exhaustive *Index* is in Latin, and the references are to the Latin translation).

There is no complete English translation of Aristotle's Works, that by Thomas Taylor having no claim to rank as such. There are, however, translations of many of the works which intending students will find it useful to read. These are (1) The Logic, (2) The Physics, (3) The *De Cœlo*, (4) The Meteorologics, (5) The Psychology (*De Anima*), (6) The History of Animals, (7) The Metaphysics, (8) The Ethics (Nicomachean), (9) The Politics, (10) The Poetics. The following are the best editions and most accessible translations of these.

(1) The LOGIC. By Theodor Waitz, Greek Scholia and Latin notes (Leipzig, Hahn, 1844, 2 vols. 8vo). Translation by O. F. Owen (Bohn's Classical Library, 2 vols. 12mo. Has notes and analysis, and contains the very important *Introduction* of Porphyry).

(2) The PHYSICS. *By Carl Prantl, Greek text with German translation (Leipzig, Wilhelm Engelmann, 1854, 12mo), and by J. B. St. Hilaire, Greek text with French translation (Paris, Durand, 1862, 8vo).

(3) The DE CŒLO and GENESIS AND CORRUPTION. By Carl Prantl, Greek and German (Leipzig, W. Engelmann, 1857, 12mo); and by J. B. St. Hilaire, Greek and French (Paris, Durand, 1866, 8vo).

(4) The METEOROLOGICS. By J. L. Ideler, Greek and Latin, with commentary (Leipzig, Vogel, 1834–6, 2 vols. large 8vo), and by J. B. St. Hilaire, Greek and French (Paris, Durand, 1867, 8vo).

(5) The PSYCHOLOGY. By F. Adolf Trendelenburg, text with Latin notes, very valuable, (Jena, Walz, 1833, 8vo; new edition by Belger); by Adolf Torstrik, text and Latin notes (Berlin, Weidmann, 1862, 8vo), and by *Edwin Wallace, text, English translation, introduction, and notes (New York, Macmillan, 1881, 8vo). There is a French translation by J. B. St. Hilaire (Paris, Durand, 1846, 8vo). There are several German translations, that in Von Kirchmann's *Philosophische Bibliothek* being the most accessible. C. Collier's Eng. Trans. (London, Macmillan, 1855) is poor.

(6) The HISTORY OF ANIMALS (*Thierkunde*). By *Dr. H. Aubert and Dr. Fr. Wimmer, text, German translation, and notes (Leipzig, Engelmann, 1868, 2 vols. 8vo. A most valuable work). English Translation by Richard Cresswell (Bohn's Classical Library).

(7) The METAPHYSICS. By *Albert Schwegler, text, German translation and notes (Tübingen, Fues, 1847–8, 4 vols. 8vo.), and by *Hermann Bonitz, text and Latin notes (Bonn, Marcus, 1848, 8vo). There is an English translation by John H. McMahon in Bohn's Classical Library; but it is not of a high order.

(8) The ETHICS. By K. L. Michelet, text and Latin notes (Berlin, Schlesinger, 1848, 2 vols. 8vo); by Hermann Rassow (Weimar, 1862–68). There is a German translation by Adolf Stahr (Stuttgart, Krais & Hoffmann, 1863, 16mo); a French translation by J. B. St. Hilaire (Paris, Durand, 1856); an *English translation, with notes and essays, by Sir Alexander Grant (London, Longmans, Green & Co., 1866, 2 vols. 8vo.), and another by F. W. Browne in Bohn's Classical Library. There are several others, in German and English, the best of which is that by F. H. Peters (London, Kegan Paul & Co., 1881).

(9) The POLITICS. By Fr. Susemihl. Two editions; one with text and Wilhelm von Moerbeke's barbarous Latin translation (Leipzig, Teubner, 1872, 8vo), *another with introduction, German translation, and notes (Leipzig, Engelmann, 1879, 2 vols. 12mo). There is a French translation by J. B. St. Hilaire (Paris, Durand, 1848, 8vo), an *English translation with notes, by Prof. B. Jowett (Oxford, Clarendon Press, 1885, 2 vols. 8vo), and another (including the *Economics*) by E. Walford, in Bohn's Classical Library.

(10) The POETICS. By Joh. Vahlen, text and notes (Berlin, Vahlen, 1874, 8vo. Best text); by Fried. Ueberweg, with text, German translation, and notes (Berlin, Heiman, 1869–70, 12mo. The translation and notes belong to Von Kirchmann's *Philosophische Bibliothek*); by *Fr. Susemihl, text, German translation, and notes (Leipzig, Engelmann, 1865, 12mo), and by Moriz Schmidt, text and German translation (Jena, Dufft, 1875, 8vo). There is *an excellent German version by Adolf Stahr (Stuttgart, Krais & Hoffmann, 1860, 16mo). There is a French translation by J. B. St. Hilaire (Paris, Durand, 1858, 8vo), and another, facing the text, in M. E. Egger's *Essai sur l'Histoire de la Critique chez les Grecs* (Paris, Durand, 1849, 8vo). There is an English translation by Thomas Twining (London, Hansard, 1812, 2 vols. 8vo.), and another (with the *Rhetoric*), in Bohn's Classical Library. There is no good English translation. Compare James Harris, *Three Treatises. The First concerning Art. The Second concerning Music, Painting, and Poetry. The Third concerning Happiness*, in *Works*, London, 1841. The first and second treatises give the substance of Aristotle's *Poetics*, and the third gives the chief thought of his *Ethics*.

In reading these works of Aristotle, the student will often need external help. In addition to those already named, the following works, selected from an almost infinite number, are especially recommended.

I. *For the General Course.*

*WALLACE (Edwin), *Outlines of the Philosophy of Aristotle*, Oxford and London, James Parker & Co., 1880. This small book contains an admirable statement, in brief form, of the chief doctrines of Aristotle, and appends the classic passages from the original on which this statement is based.

HARRIS (James), *Hermes, or a Philosophical Inquiry concerning Universal Grammar*, in *Works*, Vincent, London, 1841. Book III. contains a good presentation of Aristotelianism.

*EUCKEN (Rudolf), *Die Methode der Aristotelischen Forschung in ihrem Zusammenhang mit den philosophischen Grundprincipien des Aristoteles dargestellt* (Berlin, Weidmann, 1872, 8vo).

TRENDELENBURG (F. A.), *Elementa Logices Aristoteleæ* (Berlin, Bethge, 1868, 12mo. *Erläuterungen* in German, 1861): *Geschichte der Kategorienlehre* (Berlin, Bethge, 1846, 8vo).

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VAN DER REST (E.), *Platon et Aristote. Essai sur les Commencements de la Science politique* (Brussels, Mayolez, 1876, 8vo).

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* KAPP (Alexander), *Aristoteles' Staats-paedagogik als Erziehungslehre für den Staat und die Einzelnen.* Aus den Quellen dargestellt. (Hamm, Schulz, 1837, 8vo).

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HEYDER (Carl L. W.), *Kritische Darstellung und Vergleichung der Methoden Aristotelischer und Hegelischer Dialektik. Erste Abtheilung: Die Methodologie der früheren griechischen Systeme* (Erlangen, 1845).

* EUCKEN (Rudolf), *Ueber die Bedeutung der Aristotelischen Philosophie für die Gegenwart* (Berlin, Weidmann, 1872, 8vo). P.

II. *For the Course on Aesthetics.*

* TEICHMÜLLER (Gustav), *Aristoteles' Philosophie der Kunst* (Halle, Barthel, 1869, 12mo). * *Die Kunstlehre des Aristoteles* (Jena, Dufft, 1876, 8vo). Contains a Bibliography of the famous *Katharsis-controversy.*

REINKENS (J. H.), *Aristoteles über Kunst, besonders über Tragödie* (Vienna, Braumüller, 1870, 8vo).

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* MAYER (Philipp), *Die Iphigenien des Euripides, Racine und Göthe* in *Studien zu Homer, Sophokles, Euripides, Racine und Göthe* (Gera and Leipzig, Kanitz, 1874, 8vo).

ABEKEN (Guil.), *De Μιμήσεως apud Platonem et Aristotelem Notione* (Göttingen, Dieterich, 1836, 8vo). P.

III. *For the Course on Theory of Cognition and Ontology.*

* BRENTANO (Franz), *Von der mannigfachen Bedeutung des Seienden nach Aristoteles* (Freiburg im Breisgau, Herder, 1862, 8vo).

* KAMPE (Ferdinand), *Die Erkenntniss-theorie des Aristoteles* (Leipzig, Fues, 1870, 8vo).

* HERTLING (Geo., Freiherr von), *Materie und Form und die Definition der Seele bei Aristoteles* (Bonn, Weber, 1871, 8vo).

* EVERETT (Charles Carroll), *A System of Logic*, Boston, W. V. Spencer, 1869. In the second book there is a noteworthy attempt to show the uses of the different figures of the syllogism in obtaining and expressing our knowledge.

SIEBECK (H.), *Geschichte der Psychologie.* Part I. *Die Psychologie vor Aristoteles* (Gotha, 1880).

FREUDENTHAL (I.), *Ueber den Begriff des Wortes φαντασία bei Aristoteles* (Göttingen, 1883).

BAEUMKER (C.), *Des Aristoteles Lehre von den äussern und innern Sinnesvermögen* (Leipzig, 1877).

ROSENKRANZ (W.), *Die Platonische Ideenlehre und ihre Bekämpfung durch Aristoteles* (Mainz, 1869).

* RAVAISSON (Felix), *Essai sur la Métaphysique d'Aristote* (Paris, 1846, 8vo).

GÖTZ (L. F.), *Der Aristotelische Gottesbegriff, mit Beziehung auf die christliche Gottesidee* (Leipzig, Matthes, 1870, 8vo). P.

SCHNEIDER (Leonhard), *Die Unsterblichkeitslehre des Aristoteles* (Passau, Waldauer, 1867, 8vo). P.

SCHLOTTMANN (Konstantin), *Das Vergängliche und Unvergängliche in der menschlichen Seele nach Aristoteles* (Halle, Waisenhaus, 1873, 8vo). P.

SCHLÜTER (C. B.), *Aristoteles' Metaphysik eine Tochter der Sankya-Lehre des Kapila* (Münster, Russell, 1874, 8vo). P.

In addition to works on Aristotle, the student will find it useful to consult such books as will give him a general notion of the history of Philosophy and Dramatic Art since the time of Bacon. It is, of course, not supposed that any one will read more than a few of the works named above. A long list has been given, in order that those wishing to undertake special studies may know where to look for information. The works best adapted for the ordinary student are marked with an *. All pamphlets are marked with P.

The chairman of the committee appointed to correspond with students desiring further information is Mr. Thomas Davidson, Orange, New Jersey, who will answer all letters containing stamps for reply. Programmes announcing the name of lecturer and the date of lecture will be sent as usual to members of the School and others.

Concord, Mass., November, 1886.

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The Family in the History of Christianity. By the Rev. Samuel W. Dike. New York: Wilbur B. Ketcham, 73 Bible House. 1886.

Programm, womitzu der oeffentlichen Pruefung der Zoeglinge des Friedrichs-Werderschen Gymnasiums, welche Dienstag den 31. März, 1874, Vormittags von 9, Nachmittags von 2½ Uhr, an in dem Hoersaale der Anstalt stattfinden wird. Dr. Carl Eduard Bonnell, Director und Professor. Inhalt: Ueber den indirecten Beweis vom ord. Lehrer Dr. Kraehe. Berlin, 1874.

The Chicago Law Times. Edited by Catherine V. Waite. Vol. i, No. 1. November, 1886. Chicago, Ill.: C. V. Waite & Co.

Ueber die Berkeleysche Philosophie. Inaugural Dissertation zur Erlangung der Philosophischen Doktorwuerde, an der Vereinigten Friedrichs-Universitaet Halle-Wittenberg. Verfasst von Alfred Cook aus Plano, Illinois, U. S. A. Halle a. S. 1886.

Archivio per L'Antropologia e la Etnologia. Organo della Società Italiana di Antropologia, Etnologia e Psicologia comparata. Pubblicato dal Dott. Paolo Mantegazza. Sedicesimo Volume. Fascicolo secondo. Firenze. 1886.

Archivio Storico Lombardo. Giornale della Società Storica Lombarda. Serie Seconda. Fasc. III. Anno XIII. Milano, 30 Settembre, 1886.

Zeitschrift fuer Philosophie und Philosophische Kritik. Im Verein mit mehreren Gelehrten. Gegrundet von Dr. J. H. Fichte und Dr. H. Ulrici. Redigirt von Dr. August Krohn und Dr. Rich. Falckenberg. Neue Folge. Band 87. Halle a. S. C. E. M. Pfeffer, 1885. [This number contains an interesting article on the philosophy of Thomas Aquinas and the philosophy of the present, by Prof. Dr. Rudolf Eucken. E. von Hartmann reviews Koestlin's Æsthetik. The editor, Dr. Krohn, begins a series of Excursions through the philosophy of the present day. Dr. Falckenberg writes on the significance of the history of philosophy and the character of modern philosophy. Dr. J. Walter discusses the recent attempts at reforming the philosophy of ethics, and in particular refers to Witte's book on the Freedom of the Will.

In the eighty-ninth volume—1886—Dr. Max Schusler points out some of the chief mistakes in modern systems of Æsthetics. K. C. Planck unfolds critically the fundamental idea of Right; and his own system of realistic philosophy is reviewed by Dr. Max Diez. E. von Hartmann treats of pleasure as the highest measure of worth. There are in each of these numbers many valuable book notices.

This journal, as is seen, is near its ninetieth volume, and is the oldest philosophical journal published in any language. Within a brief period it has lost, first its senior editor, Dr. J. H. Fichte, son of the celebrated J. G. Fichte, and himself an eminent philosopher; and quite recently the associate, Dr. H. Ulrici. The new editors, Drs. Krohn and Falckenberg, have proved that the task of conducting this famous organ of philosophic thought has fallen into worthy hands. The journal is to be held consistently to its former pronounced idealistic tendency, and will in general furnish support to religious faith and conscience.]

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CONTENTS.

I. THE DIVINE PYMANDER OF HERMES TRISMEGISTUS (Reprinted from Everard's Translation) 337

II. THE PERCEPTION OF TIME . . . . . *William James*, 374

III. HEGEL'S PHILOSOPHY OF RELIGION. Introduction completed (Tr.), *F. Louis Soldan*, 407

IV. CLASSIFICATION OF THE MATHEMATICAL SCIENCES . *J. M. Long*, 417

V. THE CONCORD SUMMER SCHOOL OF PHILOSOPHY IN 1887—Course of Study in Aristotle, and Bibliography 426

VI. BOOKS RECEIVED 444

VII. TITLE-PAGE AND INDEX TO VOLUME XX.

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